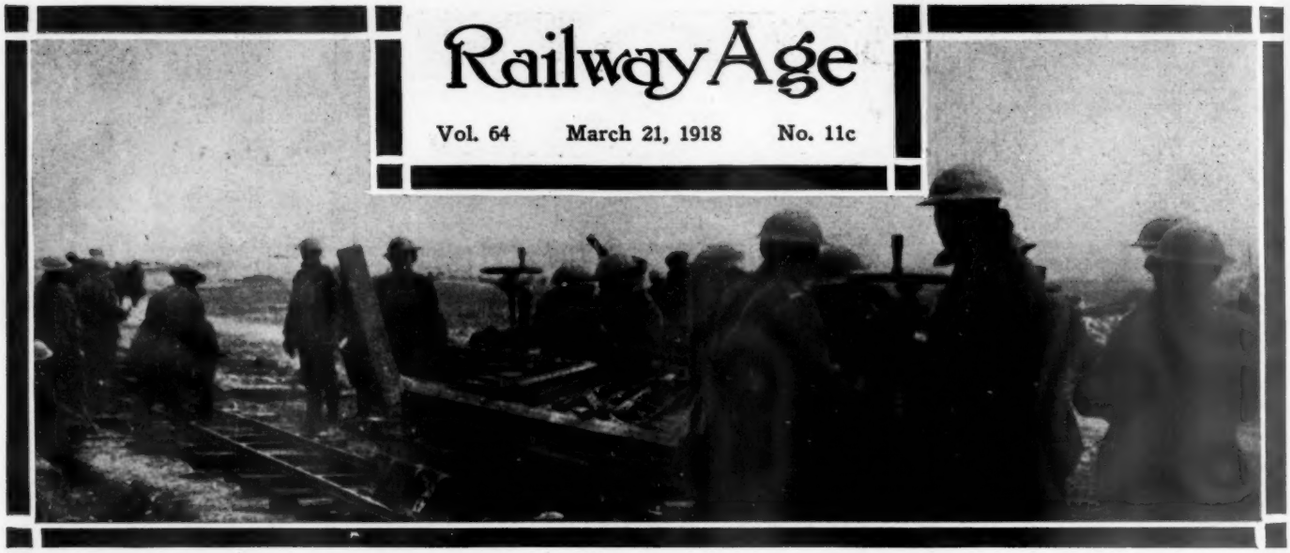
Railway Age

Vol. 64 March 21, 1918 No. 11c



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Editorial Staff

SAMUEL O. DUNN, Editor.
ROY V. WRIGHT, Managing Editor.

W. E. HOOPER, E. T. HOWSON, B. B. ADAMS, H. F. LANE, R. E. THAYER, C. B. PECK, W. S. LACHER, J. G. LITTLE, A. F. STUEBING, C. W. FOSS, K. E. KELLENBERGER, A. G. OEHLER, F. W. KRAEGER, G. L. LACHER, E. T. OWENS

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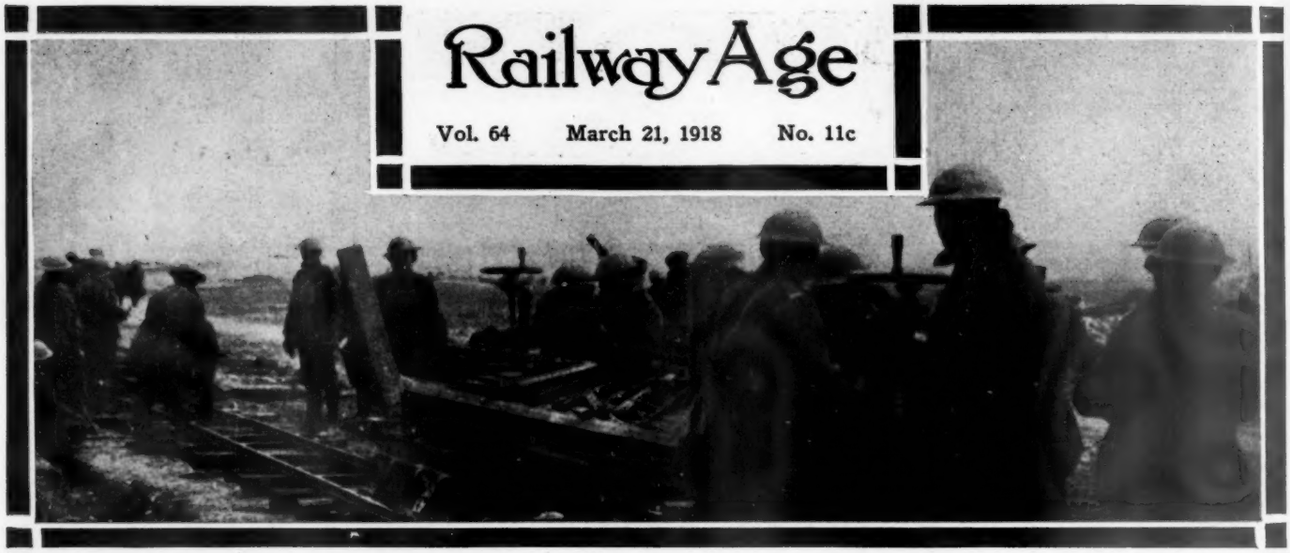

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EDITORIAL

Railway Age

DAILY EDITION

Discussion of Labor Report Restricted

In spite of the fact that the large attendance in the convention hall when the report of the Committee on Economics of Railway Labor was presented indicated the widespread interest in this subject, the discussion of the report was very limited and in this way disappointing. Either the larger portion of the membership is not yet awake to the seriousness of the labor situation or the men hesitated to speak because of the conditions existing on the railways at the present time and the fact that the director-general and his staff are studying labor among other problems. The latter is very probably the more correct explanation. By failing to take part in the discussion much information was withheld from the membership at large which would be of great importance in arriving at the correct solution of the problem.

Large Crowds at the Coliseum

The most gratifying feature of this year's exhibit is the very large number of railway men who are spending a good deal of time in the Coliseum not merely looking at but carefully studying the devices on display. *The Railway Age* doubts if any previous exhibit ever received as much intelligent, practical attention from railway men as this one is receiving. Many railway officers who attend conventions under present conditions naturally and properly feel that they must use their time to better purpose than ever in order to give the railways the very best return for the time they take away from their offices. The exhibit at the Coliseum will be closed tonight at 10 o'clock. It is to be hoped that every railway officer attending the conventions who has not visited the exhibit will yet do so.

Methods of Recruiting Labor

The Discussion of the Report on Economics of Railway Labor points to the need of a definite policy concerning the recruiting and distribution of available labor under the existing status of the railroads as brought about by Government control and War conditions. Government control of necessity will require certain departures from current practice and many such changes are being made as the administration of the railroads under Government control assumes definite form. The question arises regarding the policy which will be pursued in the hiring of laborers. As pointed out in the discussion, various state and national labor bureaus have indicated a desire to be of assistance in the railway labor field, while in at least one case there has been an expression of a desire on the part of the Government that the railways abandon existing methods of recruiting men in favor of the Government bureaus. While overcoming the exploitation of labor, which is all too common with the operation of private labor agencies, available testimony goes to show that many governmental bureaus for securing labor are subject to serious objections, prominent among which is a general lack of efficiency, assigned in some cases to an over-abundance of red tape. In view of this, any movement tending to destroy existing means of recruiting labor before insuring the effectiveness of Government bureaus would seem ill advised.

Some Advantages of the Contract System

In the report of the Committee on Ballast it was pointed out that while the consensus of opinion of railway men is strongly against ballasting by contract in normal times, such a plan is considered a necessary evil by many men in times of acute labor shortage. This is significant of the trend towards carrying on maintenance work by contract, which is now being tried out to a greater or less extent on several important roads. In the report 11 reasons are given as arguments against ballasting by contract on operated lines. While most of these reasons may also be advanced against contracting other maintenance work, the advantage of contracting such work as farmers or others living along the line, are equipped to do as well or better than the railroad forces is evident. This work includes fencing, mowing of the right-of-way, small jobs of ditching, etc. Again there are many advantages in the plan of contracting small repair work such as renewing the plank in station platforms, replacing broken window panes, repairing broken locks and many such items. Such a plan makes it possible to make these small repairs without delay; does away with the necessity of sending a man from headquarters to do an hour's work or less with the probability that his entire day will be taken up by the trip, and enables the men to be utilized on more important work without interruption, thus making it possible to carry on a greater amount of work than otherwise could be done. With the present absolute necessity of securing the maximum service from their forces, railway men can ill afford to overlook the possibilities of developing the contract plan of doing maintenance work even to the point of including the more important items such as ballasting, or the renewing of ties and rail.

Definitions Must Be Accurate

Reports presented by several of the committees this year include glossaries of terms peculiar to the subject in hand. As it is an established custom of the Association that definitions are not subject to discussion on the floor of the convention, it is entirely probable that they do not receive as careful consideration by the association members attending, as do the other portions of committee reports. However, upon acceptance these definitions become a part of the Manual and as such they should conform to the high standards set by this association for its established rules of practice. This means that the definitions must fulfill the prime and only justifications for their publication—that they convey the accepted meaning of a technical term to one not familiar with it, and eliminate any confusion of meaning resulting from

a current looseness in the use of the term. To comply with these requirements the definition must have literary merit—the diction must be accurate, and the construction sufficiently lucid to convey a word picture while allowing no opportunity for confusion, even to one entirely unfamiliar with the subject. Limitations as to space in the manual require that definitions be given only when the term is not defined in a standard dictionary or when its meaning as applied to a particular branch of engineering differs from the definition found in the dictionary. A perusal of the definitions submitted by the committees this year will convince the reader that some of them have been drawn without adequate consideration of the principles outlined above.

The Analysis of Yard Operation

THE PAST WINTER HAS demonstrated the lack of terminal facilities at many points, particularly in the east. The lines converging at the terminals have been able to deliver more cars than these yards have been able to classify and forward, so that the capacity of entire divisions and even of systems has been limited to that of one or more yards.

Where increased capacity cannot be secured by the construction of an entirely new and independent terminal, it is generally inadvisable, if not absolutely impractical, to enlarge and rebuild a yard under traffic conditions such as those which have existed during recent months for the interference with operation which will necessarily result will decrease the capacity and add still further to the congestion. However, as the Committee on Yards and Terminals pointed out in its report presented yesterday, there are frequently points of local congestion in a terminal which can be relieved by relatively simply changes. Frequently the adoption of as simple an expedient as the moving of a crossover has eliminated interference between opposing movements and resulting serious delays. It may be claimed that all such points of congestion have been eliminated so far as possible in the design of a yard and that there is not, therefore, opportunity for further improvements. However, conditions change rapidly and they have changed particularly during the last year. Such changes frequently lead to revisions in operating methods and give rise to conditions differing materially from those existing when the terminal was laid out. It is for this reason that a detailed analysis of a yard and its operation at intervals is valuable in bringing to light the changes which have taken place and in directing attention to those points where delays occur. There is no better time to make such analyses than the present, both because the need for improvements is great and also because the defects are now most evident.

Control of Tie Renewals

THE REPLIES RECEIVED from 100 railways in answer to questions sent to all the principal roads of this country have brought out the fact that in the majority of cases the responsibility for tie renewals rests on the section foremen. This is in direct contrast with the practice followed on a few roads where tie inspectors are employed or where the roadmasters are required to make detailed inspections and to indicate the ties which are to come out.

Probably an average of 300 ties per mile of track are renewed each year or approximately 2,500 ties per section. With ties costing one dollar each this means that a section foreman is responsible for the expenditure of from $2,000 to $3,000 annually for this one account. Some of the larger roads employ 2,000 or more section foremen, in which cases the foremen collectively authorize an annual expenditure of $5,000,000 to $6,000,000.

It is often urged as an objection to the plan of holding the roadmasters responsible for this work that they are already overburdened and if given this duty they will be unable to give it the time necessary to insure good results. This argument is not without merit. It, of course, does not hold true if "tie spotters" or inspectors are employed. Instead the chief objection to the last plan is based on the fact that the "spotter" has no responsibility in the maintenance of track after passing over it.

On the same roads which are leaving this work to the section foremen, with its responsibility of deciding on the expenditure of millions of dollars annually, it is safe to say that the division officers are required to secure the approval of the management for expenditures much smaller than the cost of tie renewals on a single section. The practice presents the opportunity for a foreman to show a low cost of maintenance per mile of track at the expense of safe track or to go to the other extreme and sacrifice economy to appearance. In other words, it introduces the personal element to a great extent. Certainly the amount of money involved is sufficient to warrant the responsibility being concentrated in one with wide experience and good judgment.

Plans for Next Year

WITH THE SUCCESS OF THIS CONVENTION a most natural question arises as to plans for the meeting next year, for surely the convention in 1919 should prove of equal if not greater benefit than the one now in progress. Assuming that a convention should be held, it would seem desirable to give immediate consideration to the program since the effectiveness of the meeting depends upon the work done by the committees and this work should commence as soon as possible.

Obviously some matters presented at the meeting this year have been of more immediate importance than others from the standpoint of the most vital object of the times—the winning of the War. However, owing to an inability to control the discussion under prevailing rules of order, some matters but remotely concerned with the all-important object of the hour were given as much if not more time before the convention than subjects of vital concern. An improvement in this situation as applied to future conventions would seem to demand an arrangement of the work of committees, and the reports to be presented by them, whereby particular emphasis should be given to matters closely allied to current needs. However, in making plans along any such line due consideration must be given to the fact that these are times of rapid changes. The measures of today may not meet the emergencies of tomorrow, so it would seem desirable to give the committees a certain amount of latitude in their instructions in order that they may be enabled to adjust their work and reports to the changing conditions. This would require some supervision, but a general instruction, to consider the matters of most immediate and vital importance, would seem to require but little amplification.

There is no question but that the convention has been justified by the results obtained this year. It can be done again, but the greatest good can be secured only by definitely molding the activities of the association to the changing times, not only as to the work of the committees but as to the discussions at the various sessions. But the duty of the membership does not end here, for as

pointed out by Chairman Lewis of the Committee on Economics of Railway Labor, it is the patriotic obligation of all members to participate in the work by giving conscientious and prompt attention to any circulars sent out by committees. It is only by doing their part in full measure that the association can accomplish the desired end.

Bridge and Building Meeting

About 20 members of the American Wood Preservers' Association, including a number of members of the Executive committee, met in room 1124 of the Congress Hotel at 4:30 yesterday to make plans for the convention next October. At the annual meeting held in Chicago last October, New York was selected as the location for the next convention. Owing to the conditions prevailing in the east it was the sense of those present at yesterday's meeting that the 1918 convention should again be held in Chicago.

Sir Edmund Walker

Sir Edmund Walker, who was a speaker at the dinner of the American Railway Engineering Association last night, is one of the most prominent men in Canada, and is almost equally interested in matters of finance, of education and of art. Besides being president of the Canadian Bank of Commerce, he is chairman of the Board of Governors of the University of Toronto, chairman of the Board of Trustees of the National Gallery of Canada at Ottawa, chairman of the Royal Ontario Museum, and chairman of the Art Museum of Toronto.

Today's Program

The reports scheduled for presentation before the convention today are as follows:

Roadway.
Iron and Steel Structures.
Wooden Bridges and Trestles.
Masonry.
Ties.
Stresses in Railroad Track.
Rail.
Signs, Fences and Crossings.
Track.
Wood Preservation.

Following the presentation of these reports the officers-elect will be installed and other business transacted.

The Necessity of Coal Conservation

A talk was given before the association yesterday morning by O. Monnett, a member of the Coal Conservation Committee, United States Fuel Administration, Illinois section, on the necessity of coal conservation and the precautions to take in the storage of coal. He stated that the United States will demand bituminous coal during 1918 to the extent of 600,000,000 tons and from the best available knowledge and information the production will not be in excess of 550,000,000 tons, the country being confronted with a shortage of 50,000,000 tons, which will have to be made good by more scientific methods of combustion and by conservation in other ways or it will be necessary to shut down some of the less important industries. Bituminous coal can be stored under water for any length of time without deterioration or loss. Where it is necessary to store it in open piles precautions should be taken to prevent spontaneous combustion. Mr. Monnett gave a few of the suggestions gotten up by the Fuel Administration with reference to precautions recommended for minimizing the danger from spontaneous combustion of coal in storage.

A Relic of Cambrai

The photograph shows a German helmet which Fred Poor, president of the P. & M. Company, Chicago, has recently received from Captain Fred A. Preston, aircraft division, Signal Corps, located in France and formerly manager of sales with this company. This helmet was taken from a dead German soldier after the battle

A German Trench Derby

of Cambrai. The condition of the sweat band in the helmet indicated that the German had been running some before being killed. This helmet is considerably heavier than the French helmet, which in turn is heavier than those worn by the American troops. It is of pressed manganese steel construction and weighs approximately three pounds.

Signal Committee Dines

The annual dinner of Committee X of the A. R. E. A. and R. S. A. was held Tuesday evening in the Engineers' Club.

The following members and past members were present:

J. A. Peabody, signal engineer, C. & N. W., Chicago.
Frank Rhea, Saltburg, Pa.
G. E. Ellis, signal engineer, Division of Safety, I. C. C.
F. P. Patenall, signal engineer, B. & O., Baltimore, Md.
A. M. Burt, chief engineer, maint. of way, N. P., St. Paul, Minn.
Mott Sawyer, Supt. C. M. & St. P., Spokane, Wash.
M. H. Hovey, consulting engineer, Madison, Wis.
W. H. Elliott, signal engineer, N. Y. C., Albany, N. Y.
F. L. Dodgson, consulting engineer, Gen. Ry. Sig. Co., Rochester, N. Y.
J. C. Mock, signal-electrical engineer, M. C., Detroit, Mich.
T. S. Stevens, signal engineer, Santa Fe, Topeka, Kan.
A. G. Shaver, consulting electrical and signal engineer, Chicago.

Too Mucha da Big Eyed Chick

A bunch of "dagos," working on the track, killed a big hoot owl which they dressed, broiled and added as a delicacy to the noonday meal. About 3 p. m., the boss noticed a cessation of work on the part of the dagos. An investigation found them clinging to the willows and vigorously hollering "Eu-rope! Eu-rope!" The boss proceeded to address them. "Hey, there! Waat ta 'ell's the matter with you——dagos? Lookin' fur another job? Hey!" One of the Italians replied in a faint voice: "Oh, God! Sicka da bel'. Too mucha da big-eyed chick."

Section of Siberian Line Which Japan Will Use if She Intervenes

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American Railway Engineering Association Proceedings

A Report of Wednesday's Sessions Including the Presentation of Six Committee Reports With Discussions

THE SECOND DAY'S SESSION of the American Railway Engineering Association was called to order at 9:30 a. m. by President Sullivan, with the room well filled. Reports were presented during the day by the committees on Electricity, Yards and Terminals, Economics of Railway Labor, Ballast, Economics of Railway Operation and Uniform General Contract Forms. Abstracts of these reports and of the discussions are given below. The report of the Committee on Roadway was postponed until today, while the report of the Track committee, originally scheduled for presentation on Tuesday, will also come up today.

Report on Yards and Terminals

THE PRINCIPLE OF good yard design comprises three fundamental requirements, which are:

(1) To get the train into the yard and clear the main line.

(2) To classify the cars in the yard, which includes all intra-yard movement of cars and engines.

(3) To get the train out on the main track and clear the yard.

With these principles in mind, the following suggestions arise in the form of direct questions:

1. Can you extend your yard lead or construct one adjacent to the main track of sufficient length to hold a maximum train, so that an arriving train can clear the main track quickly before entering the yard and a departing train may clear the yard quickly before going out on the main track? If trains arrive or depart at close intervals, can a second lead track be constructed? These lead tracks are sometimes called receiving or departure tracks.

2. Are your connections between (a) main tracks, (b) lead tracks, (c) drill tracks (or tracks on which switch engines operate), (d) yard tracks, so arranged that trains may enter and leave the yard with a minimum of interference with switching movement?

3. Are your yards so arranged and have you sufficient running tracks so that you can take a transfer from one end of the yard to the other without interfering with the usual switching? Could the efficiency and capacity of the yard be increased by the enforced holding open of a track (otherwise used for holding cars) as a running track?

4. Are your crossovers so arranged as to give the least interference with switching and the greatest elasticity of movement, or can additional crossovers be put in to secure these results? Where the number of tracks in the classification yard is fixed and where the number of classifications has increased, can connecting crossovers be so located between these classification tracks as to reduce the number of movements for the required classification?

5. If your receiving or departure tracks are too short, can you lengthen one track in each yard in order to take care of the maximum train?

6. Are your caboose tracks so located and have they such connections at each end that cabooses may be handled with the least amount of switching service?

7. Can you take the engine off your train and get it to the roundhouse, and also get it from the roundhouse to an outbound train without materially interfering with switching?

8. Can you facilitate handling road engines by providing a "tie-up," "parking" or "engine storage" track near the engine terminal?

9. Can your yard engines clean fires and take coal, sand and water without delay? Do you change switching crew where engine works, or do you send the engine to "tie-up" track for change?

10. Are the trackmen given an opportunity to repair busy tracks? Are you having yard derailments or delays due to bad tracks, particularly at curves, switches and frogs?

11. Can you quicken the movement of trains through the throats of the yard by putting on switch tenders at these points during the busiest part of the day?

12. Is the present assignment of tracks in the yard for the various operations the proper one?

13. Can you in any case improve the yard movement by reversing the movement of traffic?

14. Can you facilitate switching by making inexpensive changes in grade in the yard at any point? If you are operating a hump, can you change the grades of the hump and facilitate switching?

15. Are you using the cut-list system in hump yards to avoid confusion in classification and to fix responsibility for damage while handling cars?

16. Can you improve switching conditions after dark by installing lights?

17. Are you handling any cars through the yard with more movements than are absolutely necessary?

18. Could you facilitate weighing and lessen interference with other switching by rearrangement of existing connections or by the addition of other connections to the scale track?

19. Are your bad-order and repair tracks so located as to require the least amount of engine service?

20. Can you lessen the cost of icing cars by changing the track layout?

21. Are your car inspectors properly organized, and so located and equipped that they do not delay switching or the departure of trains?

22. Can some terminal delays be avoided by the installation of compressed air lines to charge the brake equipment of trains and avoid the delay of pumping air on the train after an engine is coupled on?

23. Are your outgoing trains delayed "Waiting for Orders?"

24. Is your yard or road service hampered due to lack of proper telephone facilities or other means of communication?

25. Is the time of switching crews wasted by faulty handling of waybills?

Scale Specifications and Rules.

The committee presented specifications for track scales which were practically the same as those submitted a year ago and published in the *Railway Age Gazette* of March 22, 1917, page 583.

The committee also submitted as information the rules adopted by the American Railway Association on Equipment for Testing Track Scales and on the subject of Scale Test Cars. The committee has not as yet made a study of these questions and is, therefore, not in a position to recommend the adoption of these additional rules and specifications by printing them in our Manual.

Conclusions

The committee recommended:

(1) That the Catechism of Yard Design be printed in the Manual.

(2) That the Track Scale Specifications and Rules be adopted and printed in the Manual.

(3) That the rules adopted by the American Railway Association on Equipment for Testing Track Scales and on the subject of Scale Test Cars be received as information and printed in the Proceedings.

Suggestions for Next Year's Work.

(1) Make critical examination of the subject-matter in the Manual and submit definite recommendations for changes.

(2) Report on the handling of freight in double-deck freight houses and the cost of operation. Also report on handling freight by mechanical means.

(3) Continue study of typical situation plans of passenger stations and methods of their operation.

(4) Report on classification yards.

Committee: E. B. Temple (P. R. R.), chairman; B. H. Mann (M. P.), vice-chairman; W. G. Arn (I. C.), H. Baldwin (C. C. C. & St. L), Miles Bronson (G. C. T.), G. H. Burgess (D. & H.), A. E. Clift (I. C.), L. G. Curtis (B. & O.), H. T. Douglas, Jr. (C. & A.), A. C. Everham (U. P.), E. M. Hastings (R. F. & P.), H. W. Hudson (N. Y. Conn.), D. B. Johnston (P. L. W.), F. E. Lamphere (B. & O.), H. A. Lane (B. & O.), A. Montzheimer (E. J. & E.), H. J. Pfeifer (T. R. R. of St. L.), S. S. Roberts (Cons. Engr.), C. H. Spencer (I. C. C.), E. E. R. Tratman, E. P. Weatherly, W. L. Webb (Cons. Engr.), A. J. Wharf (P. & P. V.), J. G. Wishart.

Discussion

H. B. Mann (vice-chairman): The question of the present emergency, as far as terminals is concerned, seemed to be divided into two parts; first, congestion in the yards and terminals, which may be created either by some big error in a certain yard, which is apparent to everyone, and may be corrected by the mere spending of money in large amounts; and second, a collection of little things, such as congestion in certain yards and terminals due to little defects, which have as much of an effect as one big one.

The committee sent out a circular to a number of railroads, and while they received very encouraging replies from a few men, the consensus of opinion seemed to be that the experts that were required were not available. If experts were not available, the committee felt that the association had matter in the Manual that might assist, and if it could be placed in a form that those who were interested could handle it, we still might have the necessary results.

With that end in view, they felt that a catechism was perhaps something that officers not interested in the association, or not having the time to read the Manual, could handle in the best way. The committee then formulated a list of 25 simple questions, taken almost entirely from matter in the Manual, put up in a form that men who do not read the Manual might apply, and apply in two ways. First, through the members of the association on their individual roads; second, railroads, neighbors of those who knew how to handle associations, but had not had that interesting Manual of recommended practice.

That handling could be begun in two ways; first, by the committee of experts that the line might send out; second, by sending out the list of questions to each division or each officer interested, and have him answer yes or no for that division, and send those replies in to the headquarters of the property, and then the men at headquarters could take the necessary action.

E. B. Katte (N. Y. C.): I wish to say in explanation of conclusion 2 that this concern has worked in a cooperative way not only with the Special Committee on Track of the American Railway Association but the Com-

mittee on Iron and Steel Structures of this association; also a committee of the Scale Manufacturers' Association, and there is one correction that the committee would like to have you consider as made without objection. That is with reference to the capacity of scales. Leave out all after the first paragraph. This suggestion has been made after a careful consideration of the specification by a member of the Committee on Iron and Steel Structures of this association.

The President: It is understood that under the heading "Capacity" the vice-chairman suggested that everything after the first paragraph will be omitted. That includes the matter under the second paragraph down to (b) under section 3, paragraph A.

(Mr. Baldwin then read the balance of the heads of the reports, numbers 3 to 11.

O. E. Selby (C. C. C. & St. L.): I move the adoption of the conclusion and the placing of the specifications in the Manual.

(Motion carried.)

The President: The third conclusion simply recommends that the matter be received as information, which the Board will take cognizance of.

(The committee was dismissed with a vote of thanks.)

The President: We have the following letter from the Regional Director, R. H. Aishton:

"This will acknowledge receipt of your letter of the 30 instant, together with proof of the current report of the Committee on Yards and Terminals relating to 'War Emergency Yard Improvements' and the 'Catechism of Yard Design Operation.'

"I think that your suggestion at this time that a copy of this report be placed in the hands of every operating officer would be of very material advantage in the consideration of the various matters in so far as this particular regional district is concerned, and I will be very glad, indeed, to see that a copy of the report is placed in the hands of each of the regional western railroads, and will, furthermore, suggest similar action to the other regional directors. One of the large problems confronting us is increasing our capacity and the suggestions are directly in line with this policy.

"I would suggest that a sufficient number of copies be printed for distribution, and I will see that they reach the various railroads, together with some comment of your own about the matter."

Report on Economics of Railway Labor

THERE IS NO SUBJECT of more importance to the railways than labor. The increasing cost of living, and the removal from the American field of many thousands of workers from all walks of life for military duty, and of other thousands to war industries, only partially explains the present difficulties of employers. There is an unrest among men; there is a labor atmosphere surcharged with an energy which must be wisely directed to prevent dire calamity.

The committee presented an indexed tabulation of publications each of which treats wholly or in part on some phase or phases of the Economics of Labor. This tabulation gives the name of the author, the title and date of the publication, and the shortest possible description for the guidance of the investigator.

Methods of Securing Labor

The following are the principal methods employed on American Railways for obtaining maintenance of way and construction labor:

(1) Through the Foremen: This is generally applicable in rural districts.

(2) Through Padrones or Interpreters: This is the method generally used in obtaining foreign labor. The laborers are engaged through their representative who, as a rule, either acts as an assistant or intermediary between the foreman and the men and is paid at the rate of an assistant foreman.

(3) Through Labor Agents: These agencies are generally located in the larger cities where surplus labor congregates, the labor agent acting as a sort of middleman between the laborers and the railway. In many cases the railways undertake to obtain all their supply from some representative labor agent. The latter also may represent several railways.

(4) Through Contract Feeding Companies: These companies contract with the railways to feed their labor and, in order to keep the camps full, they will also arrange with the railways to supply the laborers. As a rule, the latter are confined to the floating labor, but not to gangs of foreign labor. The feeding companies usually arrange with labor agents to supply the men for them.

(5) Through Exclusively Operated Railway Labor Agencies: A few roads have provided their own labor agencies in about the same manner as that usually employed by the labor agent, but this has not been developed to any great extent.

(6) Through State and Federal Labor Bureaus: This has been attempted to a greater or less extent of late years, but for various reasons it is seldom that these agencies can supply the class of labor that is required for railway purposes.

(7) Through Representatives of Foreign Governments: In some of the larger cities these men have acted as labor agents for recent arrivals of immigrants from their respective countries in much the same manner as the independent labor agent does. Of late years, this has not been an appreciable factor and since the war it has ceased altogether.

The methods employed by the railways for obtaining labor have, in general, remained the same for many years. They have competed in the past with contractors and manufacturing establishments employing large numbers of common laborers. Labor agents or padrones were formerly the sources of the labor supply, but there has been a steady decline of late years in the classes of men that reach the labor agents. A large part of the better class of unskilled or common foreign labor that formerly went directly to the railways now reaches the mills and factories through channels other than the labor agent, which results, as a rule, in a poorer class of labor only being left available for the railways through these agencies. There has also been a steady decline of all classes of common labor available for railway work, due to better and more remunerative opportunities in other lines of industry. The railways have met this condition in an unorganized and desultory fashion, adhering to original

methods of employment and endeavoring to obtain the additional labor required by various practices such as maintaining a low hourly rate, but adding for extra hours not actually worked in order that the daily wage may be increased without affecting the hourly rate. Also a gradual lessening of supervisory effort on the part of the foreman and others in order to hold the men, has contributed to a greatly decreased efficiency.

The National Immigration law, which became effective May 1, 1917, requires a literacy test and, it is believed, will tend seriously to curtail the supply of common labor; but, with the exception of Mexico, its full effect may not be felt until after the war.

It is believed by the committee that the time has come when there must be a better understanding by the railways of their labor problems; and more study given to the improvement in methods of securing, organizing and educating unskilled or common labor; also that there must be co-operation among the railways, looking towards the conservation of the labor supply, especially in the large centers. Committees consisting of a representative from each railway entering the larger labor centers could, to advantage, be formed to study local labor conditions and to keep their respective companies informed of labor conditions generally. These local committees might be made up of persons who are directly concerned with the employment of the greatest number of laborers in the territory tributary to such centers.

In a study of cost for common labor by the sub-committee on labor of the Chicago Zone Railways (an organization consisting of all the roads entering in Chicago and supporting the Presidents' Conference Committee), the sub-committee has grouped and defined common or unskilled labor as follows:

(a) Native: Consists of laborers who reside in the vicinity, most of whom maintain homes within access of the work. As a rule, this class of labor is the most efficient and no expense, other than the daily wage, is incurred by the employer. The amount of this class of labor available for construction work is usually insufficient.

(b) Foreign: Consists of laborers who come to work in groups usually through a labor agent or one of their own number who acts as a leader. These men usually board themselves. Transportation and free housing are provided by contractors or the railway company.

(c) Hobo Labor: Consists of tramp laborers, nearly all of whom are employed through labor agents; and for whom transportation, housing and feeding facilities are furnished by the contractor or railway company. Laborers in this group differ from those grouped as foreign laborers principally from the fact that they are employed singly and their continuity of service is of such short duration.

It is customary for railways to provide free transportation for common labor when entering their employ. Special equipment is sometimes necessary, and frequently these trips cover long distances. Foreign labor will generally arrive at the destination without desertion; but in the case of the hobo, there is considerable loss, the amount being proportional to the length of the trip and weather conditions. Cases are reported where special equipment was provided for shipments of over 200 miles and less than 20 per cent. of the men arrived at destination. The average arrivals for all distances is probably about 85 per cent.

There is frequently a further loss of about 15 per cent. caused by the failure of laborers to accept actual service upon their arrival at the work. While this is especially true of the hobo, it applies, to a more or less extent, to all classes of laborers who come to the work singly. For extra gang and construction work it is customary, where possible, to ship men from the labor center so that they may arrive at the work in the morning or early part of the day in order that the men may be set to work immediately; otherwise, the loss from those not accepting service is increased. A certain percentage may be expected to desert after having obtained supper, lodging and breakfast without having performed any work whatever.

Foreign labor is affected quickly by rumors of slight increases in pay and better working conditions. It is not unusual for an entire force to leave the work on a few hours' notice. The rate of pay is not relatively so important with hobo labor as with other types of laborers.

Studies extending over some years indicate that free transportation and intoxicating liquors are among the important factors in promoting short service, which, in the case of hobo labor, is its greatest drawback. These conditions are aggravated by poor working conditions and surroundings. While longer service is obtained from foreign labor transported free of cost, the practice is open to more or less criticism. By means of this universal free movement, common labor is enabled, often upon a mere whim, to move back and forth without cost to the laborer from one part of the country to the other, causing a great decrease in man-power with resulting disorganization and increased cost of work to the railways. It is a question whether better results would not be obtained if all roads were to discontinue this practice and charge for transportation on some basis that, while protecting work at a distance from labor centers, would discourage this wandering tendency of much of the common labor.

Unfortunately, it does not rest with the railways to remove entirely this source of difficulty. A large percentage of free travel is on freight trains, between, in and under cars, which for various reasons, the railways have apparently been unable to control. Town and city ordinances contribute, to some extent, to this troublesome problem. Better co-operation between the railways and states would do much to improve this condition.

Unfortunately, the true reasons are not always given and the figures can only be taken as pointing to the probable cause; the desire for ready money is more frequently the reason. Laborers will leave and return to the same job in the course of a few days, the lost time being spent in idleness. Co-operation between railways and local authorities and better housing and working conditions would greatly ameliorate this condition.

It will be noted in the above statement that the average length of service for the year 1917 is materially increased over that of 1916. This is in part due to greatly improved boarding and housing facilities.

The stopping of immigration caused by the war and the effects which must culminate because of it has, however, completely changed conditions. The conditions brought about by the war now make it imperative that readjustments be worked out which will have for their purpose better conservation of man-power, and more careful selection and continuity of service of the common labor necessary to maintain the railroads.

The committee desires that this be considered a progress report, and that the subject be continued during the coming year.

Feeding and Housing Maintenance of Way and Construction Employees

No one type of camps or method of feeding men can be offered as a standard applicable to all roads or even

to all gangs on one road or on one division of a road. In many ways each camp is a problem in itself, although a successful plan at one point will be applicable to other camps of the same general character. The most important condition governing the character of the housing and of the food provided is the nationality of the men in the gang. The Italian does not desire the same kind of food as the hobo, nor does he want it provided in the same way. Almost every nationality and class of labor employed on track work has its peculiarities and customs which must be respected, if the men are to be retained in the service of the road.

The highly localized labor of a few years ago has now become a thing of the past. The conditions of the last three years have caused almost all classes of men to move more freely from one part of the country to another than ever before, with the result that there is a greater diversity of forces on almost every road than was found a few years ago. This condition makes necessary the closer study of the housing and feeding of these men in order that their wants may be satisfied in a manner approximating that to which they have been accustomed, for unless this is done they will become dissatisfied and go to other work. On many roads the class of men now employed demand widely differing accommodations from those provided a few years ago.

Extent to which housing is necessary depends on a number of conditions other than the nationality of the men employed. Important among these are the availability of local accommodations and the extent to which the gangs are moved from place to place. The practice is quite general over the country to provide houses for section foremen at points where the foremen find difficulty in arranging for them. Although limited originally to such points where they were provided to enable the roads to hold foremen, this practice has spread on some roads until it has become standard to provide such houses. In past years it was unnecessary, except in isolated instances, to provide housing for section forces, as they were recruited locally and lived at home. With the advent of the foreigner into track work it has been necessary to provide lodging for him, as he is unable to secure accommodations in many communities along the line. This has led to the very common provision of bunk houses at section headquarters in which these men can live. Such facilities are provided for about 75 per cent. of the track forces on the Long Island, which employs foreign labor almost exclusively.

The character of the housing provided for section laborers varies widely. On the Seaboard Air Line, where the negro is employed almost exclusively, it is the standard practice to provide four houses for the use of that number of laborers and their families at section headquarters in addition to the house for the foreman, enabling each negro laborer to bring his family with him. On those roads in the Middle West on which both native and foreign laborers are employed in section gangs, housing is commonly provided only for the foreigner, although no difference is made in the wage.

Car bodies removed from the trucks and placed on the ground are most commonly provided as living quarters for these men, although a number of roads have designed and built bunk houses for this purpose. Where it is necessary to provide housing for laborers of this character, the latter practice is much to be preferred. The car body has little to recommend it other than its ready portability and its supposedly low first cost. At section headquarters, where accommodations of this character will be required permanently or for extended periods, a road can well afford to provide more convenient and sanitary arrangements.

The provision of housing accommodations is even more necessary with extra gangs. Even if the work is such that a gang may be located at one point for a considerable period, it is frequently impossible to recruit a sufficient force locally; and it then becomes necessary in most instances to house such gangs in camps.

In addition to these fixed camps it is necessary to house the men in floating gangs who move from one place to another as the work progresses. This is the more common condition, particularly on the railways in the West, where extra gang work is confined very largely to the renewal of rail and ballast and to similar work which progresses from one point to another. The earliest and the most common type of portable camp is the converted box car. In most cases the cars which are in this service are small and of light capacity, and for this reason they have frequently been condemned as unfit for revenue service. From the nature of its construction a car of this character is difficult to maintain in a sanitary manner and, as a result, it has come into quite general disfavor among laborers in recent years. Because of the important advantage of ready portability the railways have been hesitant about giving up cars for the housing of men, but the general prejudice against them because of their unsanitary condition has led a number of roads to revise their standard plans materially to improve conditions during the last three or four years.

One of the most important objections to the old type of car was the number of men crowded into it, bunks being ordinarily provided for 16 men in a 34-ft. car. Probably the most important improvement which a number of roads have made in the design of their cars has been to reduce the number of men housed in each car. Another important consideration in the design of a bunk car is ventilation. Until recently it has been the common practice to place two windows in each end of a car, one on each side. A practice much to be preferred is that of the Missouri Pacific car, whereby a window is placed opposite each upper and lower berth.

In many cases it is not possible to equip a sufficient number of cars from those condemned for revenue service and it then becomes necessary to take other cars from commercial traffic. The car shortage of this year has illustrated the cost of this practice and has given an incentive to the development of substitutes for the box car which still possess the advantage of portability. Thus the Chicago, Milwaukee & St. Paul has designed a sectional building about the size of a car body, which is built of new lumber by company carpenter forces and which can be taken down and loaded on a flat car for movement from place to place. The Chicago & Northwestern has developed a somewhat larger building which can be handled in the same way. The Southern Railway and a number of other roads have equipped some of their gangs with portable steel buildings, several types of which are now on the market. An important advantage of these portable buildings is the readiness with which they may be fumigated and maintained in a sanitary condition.

Other roads have resorted to tents in which to house floating gangs. The Los Angeles & Salt Lake housed a number of gangs in tents equipped with board floors last year. The Buffalo, Rochester & Pittsburgh also used tents for two or three years, although it has recently abandoned them for portable shanties.

Equipment Provided in Camps

The character of the equipment provided in bunk cars and the responsibility for its provision vary greatly on different roads and, in many cases, between different camps on the same road. It is the common practice for

a railroad to provide the bunks in the cars and also stoves. Beyond this point the responsibility varies, the men providing their own bedding in some instances and the contractor doing this on other roads, while on still others all bedding equipment is provided directly by the railways.

Until a few years ago wooden bunks were almost universally employed in cars and in camps, these bunks frequently being installed in the cars by carpenters in the spring and removed at the close of the season when the cars were returned to revenue service. Aside from the expense of equipping the cars with wooden bunks, these bunks have been objectionable because of the great difficulty in keeping them free from vermin and dirt; and they have been unsatisfactory in other ways. This has resulted in a rapidly increasing use of metal bunks of which several types are now available. While wooden bunks are still to be found in many camps and on many roads, they cannot now be considered in accord with the best modern practice and are not to be recommended for a modern camp.

The men are required to provide their own bedding on a number of roads. On other roads bedding is furnished by the boarding contractor in connection with his arrangement for the feeding of the men. Other roads, particularly in the East, provide the bedding themselves.

Other facilities commonly provided by the railways at camps include stoves, washbasins, etc. There is also a distinct tendency in the more modern camps to provide conveniences for the men, such as shower baths, hot and cold running water, sanitary toilets, etc. In addition to these facilities the Baltimore & Ohio has added a steaming room for the steaming of clothing, and stationary tubs for the washing of clothes in some of its more recent camps.

Another development in some of the more modern camps is the provision of a separate room or car for a lounging or clubroom in which the men can spend their spare time. In some instances where camps have been so equipped, daily and illustrated papers are provided and other inexpensive attractions offered to occupy the spare time of the men and keep them more contented in the service.

The Feeding of Employees

The best method of feeding track laborers is a much disputed question and one concerning which there is much controversy at the present time. Without doubt no one method is equally applicable to all nationalities and to the widely varying conditions. At the same time no one phase of the treatment of track labor is more open to criticism at the present time than this, and it is important that the railways give this subject more attention.

With some nationalities, as, for instance, the Italian, it is necessary to allow the men to feed themselves in their own way. While this frequently results in their underfeeding and lessens their efficiency, it appears to be the only arrangement under which the men will work. However, in most cases it is not only possible for a road to feed its men directly, but it is actually necessary for it to do so, as the only practical way in which the men can be fed.

In the South it is the very general practice for a foreman to feed his men and to charge them for board, the company protecting the foreman against loss by deducting the amounts due him from the pay of the men. With this plan it is possible for the men to express their desires regarding the amount and character of their food directly to the foremen and to secure what they want more readily. The most serious objection to the plan is the difficulty in preventing some foremen from taking advantage of the men through excessive charges and in other ways. While most roads on which this system is in effect provide supervision of the charges for board made by the foremen, it is very difficult to detect and to prevent irregularities, particularly among colored laborers. On the New York Central Lines west of Buffalo it was formerly the universal practice for the foreman of each gang to buy the provisions and collect from the men pro rata for the exact cost of the food, and this practice is still followed with white men. Foreign laborers are now fed by the track supervisor through the foreman at a fixed rate per man which allows the supervisor no profit, while negro gangs are boarded at a fixed price per week, the charge being deducted by the company in all cases.

The practice most commonly followed in the West is to contract the boarding of all gangs to a contractor specializing in this work and to leave all details regarding the purchase and preparation of the food to him, the company deducting the amount for board from the pay of each man and turning it over to the contractor directly. With such an arrangement the railway usually provides the cars or camps and supplies such as stoves and tables, while the contractor furnishes the dishes and cooking utensils and all kitchen help. Generally the contractor who feeds the men in the camps also operates a labor agency with a view to keeping the gangs full. By this method a railway transfers the responsibility for the feeding of its men to an organization specializing in this work and gains the benefit of this specialization. At the same time this arrangement introduces a third party between a railway and its employes whose interests generally do not coincide with those of either of the other two.

This conflict of interest has led to the operation of commissaries and the feeding of men directly by the railways in a number of cases. The New York, New Haven & Hartford, the Delaware, Lackawanna & Western and the Pennsylvania Railroad have adopted this plan, and the latter road reports that camps operated in this manner are much preferred by the men. In general the policy of a road furnishing its own camps is to provide the men with a sufficient amount of proper food and without profit, removing the tendency for the exploitation of the foremen.

Where the boarding of the men is contracted to a commissary company the rate per meal, or more commonly per week, at which the men are to be charged is determined by agreement between the company and the contractor, and the men are advised of this arrangement when hired. The amount due the contractor is then deducted by the company from the wages due each man and is remitted directly to the contractor.

On the Nashville, Chattanooga & St. Louis the company boards its own men in every gang except one or two special organizations employed on construction work. The men are charged for board on the basis of cost which was computed several years ago, this amount being deducted from the daily wage. No deduction is made for rainy days, while gangs are moving, or where men fail to work for any other reason. No readjustment of this charge has been made in recent years on account of the increased cost of supplies.

To compensate a boarding contractor for the increased cost of foodstuffs and at the same time to keep the rates charged the men for board at a reasonably low figure, the Buffalo, Rochester & Pittsburgh now pays the contractor five cents for each meal furnished a laborer actually at work. The Maine Central accomplishes the same

purpose by reimbursing its foremen, who feed their men, for the actual cost of board in excess of 50 cents per day. The New Haven pays part of the cost of board in still another way, charging the men $4 per week for the first four weeks they are in the service of the company and $3.50 per week thereafter. This latter rate, which is less than the actual cost to the company, is offered as an inducement to the men to remain in the service. The Southern goes still further with its extra and construction gangs, paying them a fixed wage in addition to board and then paying the contractor for all meals served without making any deductions from the pay of the men. This eliminates all accounting between the company and the men and removes all uncertainty and cause for dispute concerning deductions from the pay checks, a very important consideration in the mind of the negro.

Another method to protect a boarding contractor against the high cost of foodstuffs is to pay him the actual cost of the food and service plus a fixed percentage. This plan was adopted at several camps on the Big Four last year and has also been tried on other roads.

The committee also presented descriptions of a modern camp on the Baltimore & Ohio and of the system adopted by the New York, New Haven & Hartford to feed its men. Abstracts of the laws of the various states governing the housing of men in camps were also included.

Equating Track Sections

The committee reported progress in compiling data based on the reports received from 20 railroads of the distribution of labor on 76 special track sections. Two of these roads have reported discontinuing this report on account of insufficient force and abnormal conditions of labor.

Conclusions

The committee recommends:

1. That the Bibliography be accepted as information and printed in the Proceedings.
2. That the report on Methods of Securing Labor be accepted as information and printed in the Proceedings.
3. That the report on Feeding and Housing of Maintenance of Way and Construction Employees be accepted as information and printed in the Proceedings.

Suggestions for Next Year's Work

1. Study and report on plans for organizations to obtain labor for railways.
2. Continue the study of equating track sections.
3. Study and report on typical plans of boarding-cars and boarding-houses for railway laborers.

Committee: E. R. Lewis (D. S. S. & A.), chairman; C. H. Stein (C. R. R. of N. J.), vice-chairman; W. J. Backes (N. Y. N. H. & H.), R. A. Baldwin (C. N.), J. Q. Barlow (S. P.), A. F. Blaess (I. C.), W. M. Camp (Railway Review), H. M. Church (B. & O.), W. R. Dawson (N. & W.), R. C. Falconer (Erie), R. H. Ford (C. R. I. & P.), W. R. Hillary (P. L. W.), E. T. Howson (*Railway Age*), C. B. Hoyt (N. Y. C. & St. L.), C. M. James (A. C. L.), W. A. James (C. P.), A. C. Mackenzie (C. P.), Thos. Maney, J. C. Nelson (S. A. L.), C. A. Paquette (C. C. C. & St. L.), J. W. Pfau (N. Y. C.), H. R. Safford (G. T.), H. J. Slifer.

Discussion

E. R. Lewis (Chairman): In introducing this report, the committee asks that the members keep in mind the date when this report was written. It was completed in November last year, and the committee realized at that time the impossibility of anticipating the probable changes in the situation, and it was decided in committee at that time that it would be necessary to consider such changes as we were pretty sure would occur on the floor of the convention today.

These changes have come thick and fast. At the present time the railroads are definitely under active government control. It is presumable that the railway employees, including maintenance of way labor, will receive the benefit of employment under some sort of governmental agency, and that the railways will be benefited by the furnishing and the equitable distribution of adequate man power in this crisis. But the labor question is none the less a serious question. It is becoming daily more apparent that the railways must conserve labor in every manner possible.

There are various methods of conserving labor in railways. There is the possibility for improving working conditions and the methods of hiring, distribution, feeding, housing, the grading of wages and the opportunities for advancement. There is also the possibility of the introduction of labor saving devices along these lines. The vast importance of the labor problem to this association and to the world is a matter of common knowledge to us all. The maintenance of way department of the railway may be expressed in relative money terms. There is more money spent for labor in the maintenance of way department of railways than is spent for maintenance of way material. I think it is safe to say that labor amounts to from 53 to 56 per cent of the money spent. You are urged, therefore, to give this committee and the association the benefit of the very fullest discussion and interchange of thought here today. We want results now for the season of 1918. We want it not only for this association, for the railways that we represent, but for the governments of the countries at war. In this period of unrest this is a matter that I think should receive the serious consideration of us all. We are on a war basis. We have had many routine duties and still have, but they are changing from a peace basis —have changed—and we must look at things from a war standpoint. This matter of labor is the most important thing we have to consider, and there are routine duties that we can put off from time to time or delegate to someone else, while we respond to inquiries relating to this matter of getting and keeping matter for the railways, for any labor that we conserve means conservation for all, and further than that, there have been times when the circulars from committees have not received the attention they should receive at the time of a world crisis like this, when our work is important. As you know, the association must depend on the committees, and the committees must depend on the membership for these responses.

Last October, while the committee was formulating its report, matters were brought up in connection with the securing of labor, with a great deal of emphasis, which have not been included in the report, because of rapid change in the situation. It is believed, however, that suggestions along the following lines represent the fast crystallizing thought of the members at large of this association, as well as the members of the committee. These points are as follows:

1. In order to secure a more uniform distribution, especially of unskilled, floating, or unemployed labor, it is recommended that centralized agencies (preferably under the control of the Regional Directors) shall be maintained in all large labor centers throughout the United States. Such agencies should, where possible, co-ordinate with state and municipal agencies. They should contain a division or bureau especially devoted to securing common labor for railways.
2. For the purpose of strengthening centralized agencies, in the event that they shall be established, the railways should call upon them for such additional labor

as cannot be obtained in their local fields before endeavoring to obtain it through other agencies.

3. In order that the railways may meet the demands of transportation with safety and promptitude, it is essential that they shall be efficiently maintained. As an aid in its accomplishment, as well as to permit co-operative effort to be more quickly effected between the railways themselves or through the duly constituted governmental authorities, it is recommended that each railway designate some person familiar, by training and experience with such matters, to study in detail the labor requirements necessary for the proper maintenance of its roadway, also to collect all available data looking toward the utilization of the various kinds of floating and other railway labor which in the past it has been found difficult to hold in continuous employment.

Very often a gang of laborers are disorganized after leaving the service of one railway when with a little preparation they might easily be employed without loss of time and without loss of efficiency to the railways by a second railway and again by a third.

In connection with "bibliography" Mr. Lewis said: After some consideration it was believed that the members of the committee had better compile this bibliography themselves, in order to make sure that nothing might be overlooked, which at the time of compilation existed and should be included.

The report on "Methods of Securing Labor" is presented by the committee as a matter of information.

In connection with the subject, "Feeding and Housing of Maintenance of Way and Construction Employees," the matter presented in this report is offered as information which we would desire to have printed in the Proceedings.

E. F. Wendt (I. C. C.): I wish to inquire what provision is made to insure the sanitary condition in these camps, and to ascertain the medical conditions. Is there any inspection of the camps by trained and experienced medical officers?

E. T. Howson (*Railway Age*): That is covered in the report, but for the sake of saving time that part was not read. Certain roads do have regular periodic inspections. On the Chicago Terminal division of the Rock Island inspection is made by local company physicians each month. The Chicago & Northwestern has a medical officer who gives particular attention to the sanitation of camps, the refrigeration of food supplies, and the character of the water, even to the extent of requiring that water for camps be hauled to these camps from sources of known quality where the water at the location of the camp has not been analyzed and proved. Such inspections, however, are all too limited, in fact, they are not common, but are made on only a few roads.

J. V. Hanna (K. C. Term.): May I ask if the committee knows anything about the work of the Federal employment bureau?

Mr. Lewis: The committee has some information on this subject, and I have also had experience with state agencies. We have been informed that state agencies were ready and willing to organize and could provide labor. I have on several occasions given them direct orders for labor.

F. R. Layng (P. & L. E.): We received a circular from the Federal employment bureau and I went to Pittsburgh to confer with a local government representative there, who is also representative of the Pennsylvania Department of Labor. He told me he was in no position to give us any help in securing common labor. He was giving his attention primarily to the securing of skilled labor for the Government, particularly the ship-building industry. I then went to Erie at the other end of our line and consulted with the Government agent there with the same result. I think that these bureaus of the Government are really competing with the railroads for labor, and that we cannot look to them for any help as they are at present organized.

On our own road we have established a local agent in Pittsburgh and one in Erie, and we have been moderately successful in securing labor through them. We make no charge for securing a man a job, as the usual employment agent does. We furnish transportation. I think it was the intention that the Regional Director rather expected us to discontinue that practice. My investigation resulted in the conclusion we would not dare do that under present conditions.

W. H. Courtenay (L. & N.): The committee in its able report has not referred to the economic waste of moving labor from one section of the country to the other.

The Louisville & Nashville, which I represent, has lines extending from St. Louis and Cincinnati to the gulf.

In the last two years there has been an enormous quantity of negro labor travel over our lines to industrial establishments and other roads in the North. That militates against the interest of the cotton planter, the sawmill man, and every other employer in the South. Of course, it is a difficult matter to regulate.

I can appreciate the situation of the roads which do not have a supply of labor living on the lines. They must get it somewhere. The South has suffered greatly from that condition.

As a general proposition there is almost no foreign labor employed on the L. & N. Our two sources of supply are the negroes of the South and the white people living in the mountainous districts which we touch at many points for many miles. It seems to me the best way, looking to the future, is in providing houses for them and endeavoring to locate them with their families. A negro will not work without the negro women about him. The practice on the road which I represent is almost invariably to provide a good house for the section foreman and generally provide at least two double laborers' houses and sometimes more. I think that is a good plan.

Another wise provision in order to obtain labor, which can be done in the South, if not in the North, is to retain the track laborers the year around, or at least retain the majority of them. Formerly it was the custom on our road to work different numbers of men on the track in the winter season than in the summer season, the summer season lasting seven months and the winter season five months.

We have departed from that and authorized our roadmasters to use a given number of men per year. That enables us to use the labor to better advantage. There are a great many men who are attached to a locality and they will not work away from that neighborhood. But in some cases men are content if they can go home once a week or once in two weeks.

Reference has been made to the boarding car, which has been condemned in pretty general terms, but the boarding car is not disliked by the negro. He is a gregarious animal and rather prefers the boarding car. He does not object to sixteen men in a car, while a white man might prefer a little more accommodation.

As to building the camps, such as have been illustrated here, it is a rather expensive project. If a road can get men without doing that, it would hardly seem that we were justified in going to such enormous expense, particularly in a moderate climate.

As to what the roads will do for labor, it is a difficult proposition. We have managed to hold a good many of our men, notwithstanding that the coal mines are paying boys of 16 $4 to $4.16 a day to drive a mule in the mine.

Notwithstanding the fact that laborers can get employment at high rates, they frequently prefer working on the railroad, and much depends on the treatment of the men by the foremen. I do not mean the men getting good food, but having the foreman treat the men with reasonable consideration, as a matter of justice. We have had men leave us and go to other roads, and we were surprised to see them come back very often, and the reason they came back was they said they were treated better. If the laborer is given even-handed justice by the foreman he will appreciate it, and much can be done by that sort of treatment.

(The President adjourned the meeting for lunch.)

Afternoon Session

Mr. Lewis: In answer to the remarks made by Mr. Courtenay before lunch, it was not intended by the committee to put forth the recommendation for bunk-houses and to condemn cars for all cases. There are some kinds of labor that are not like the negro labor. Some of them would rather have houses than cars if it were possible. Of course, the sanitary feature is something that we do not want labor to lead in. It never will lead in it. We have to at least give the help that is necessary along that line as near as possible.

Mr. Courtenay mentioned the economic waste of labor in its transportation. That matter has been covered by the committee. In this connection there is an important matter, which is car conservation. Cars are scarce in this country, and in order that cars be available for laborers, they would have to be conserved for that purpose. Probably on account of the scarcity of cars, there will be more bunk-houses needed. There will be many more cases where we will have to use bunk-houses than cars on account of car scarcity. We will be repairing cars that before were not considered necessary.

Edward Gray (C. & O.): I would like to call attention to the fact that the railways are not alone in wanting labor. The important matter is to increase the general supply of labor in the country for all of the really necessary industries, the railroads among them. The measures that we are considering have been considered by the committee, and of course look to the railways getting their own supply. They are competitive in their nature. Every other industry can also serve labor in the same way, offer them the same advantages, offer them an equal measure of justice, offer them superior accommodations.

There is a broader aspect. It is necessary that the supply should be increased, or rather, the total labor supply of this country should be used for the essential things, and gradually taken from the non-essential things. I don't think there is any other way in which labor can be had for the things we want. As it stands now, the least important of any industry in the country competes with the railways, with the shipbuilders. I don't think that any industry can be named so unimportant that it is not left free to compete, possibly with advantages in the matter of securing labor.

The railways have, of course, a fixed price level. Their power to buy is limited, their power of earning is limited. We try to keep prices down by the artificial fixing of prices, on essentials, but in the matter of luxuries and the non-essentials, there is no such fixing of prices. In the matter of employing labor they have a possible advantage. They can give all they want, and the public can buy at any price that they fix. Meanwhile, of course, we are led to think it is necessary to keep up every kind of activity.

I don't think it is possible to solve the matter without concentration. It is a matter of sacrificing someone, deciding what is less necessary in favor of what is more necessary. Of course, there cannot be an exact definition, but I think all of us with a little consideration could easily choose the things that are of less importance.

P. G. Lang, Jr. (B. & O.): There is one feature in connection with the handling of labor at this time that we experience in Pennsylvania, and that is the influence of liquor on the large overturn among common labor. I simply want to call attention to this as one factor in this problem. Those of you that are in dry territory do not have this problem probably at all. At least, not to the extent that we do. We find that on pay day there is a large percentage of our men who leave us for several days at a time.

The President: That is a subject I would like to hear discussed. If there are some people from dry states I think the association would be interested in hearing what their experience has been.

L. M. Perkins (Nor. Pac.): We have had some experience in the state of Washington on the west end of the Northern Pacific, and our experience is that it is complicated with the large amount of other work. Under the existing conditions, men are able to get work very readily, and they quit just as often as they did before, but the pay check lasts a good deal longer and they stay out longer. We have more idle men lying around.

J. L. Pickles (D. W. & P.): Another aspect of this is the influence of the commercial labor agents. Their interests are diametrically opposite to the interests of the company. The oftener men leave, the oftener they get their fee, and I believe they offer every inducement to these men to quit. The railroads would gain a point if they could get away from the use of the commercial agents.

Mr. Lindsay: I think we will all agree that the latest offspring of the association, the Committee on Economics of Railway Labor, gives promise of being an infant prodigy. I hope that it will continue its work and realize all we expect of it.

Labor Saving Devices

An Ice Cutter Car

E. R. Lewis, of the Duluth, South Shore & Atlantic, described an ice cutter car which he is using to remove solid ice and densely packed snow from track centers. The device consists essentially of a row of teeth of tire steel, bolted to a steel plate set across the track above the rails in front of a small plow, both the teeth and the plate being hung under the middle of the car and being raised and lowered by means of a counter-weighted lever operated by compressed air obtained from the locomotive. The teeth rip the ice loose while the plow throws it outside the rail. The ice cutter can be operated at from 4 to 6 miles per hour in heavy snow and from 2 to 5 miles per hour in solid ice, the total cost of operation being about $75 per day. It is estimated that it will do the work which would cost $1,500 per day to do with pick and shovel. This car costs approximately $1,000.

Discussion

R. C. Ford (C. R. I. & P.): The Rock Island has used the Jordan leveler about the same as Mr. Lewis has described. We cleaned two tracks at a time and took the ridge out between the tracks. All that Mr. Lewis has

stated is equally true as to the Jordan leveler. It has the additional advantage that it of course takes the ridge out and throws the snow out well beyond the two tracks. This winter in our large Burr Oak yards we took and abandoned one track and threw the snow over for five tracks, piled it up and then took a clam shell and loaded the snow out. I don't know how much the saving was there, but it was a simple thing.

Edwin F. Wendt (I. C. C.): I understood Mr. Lewis to say this device cost about $1,200. Does that cost include the cutter as well as the car, and if so, was it the cost in 1917, or some other year?

Mr. Lewis: No, it does not include the car. This ice-cutter car is not made to do the work of a leveler; in fact, it is not designed to handle soft snow, but in a yard after you have used your leveler and all your other appliances, and you have left snow and ice four or five inches above the top of your rails. I don't think you can get clear of that ice with any plow. I have tried plows many times and never have had any success until I got this tooth arrangement.

Mr. Lindsay: I know many roads in the east would have given considerable for it if they could have had it this winter. They experienced such prolonged cold weather that the ice formed in the yards faster than they could possibly get labor to remove it. Finally in desperation we took a tie 8x12, with a beveled front, put a 6 in. flanged angle iron on the top of it, sharpened the edge and put teeth in every 6 in., put it in front of a wheel like we used to spread cinders, and we pushed it through the ice with good results.

Oxyacetylene Welding of Pipe Lines

G. J. Ray, chief engineer of the Delaware, Lackawanna & Western submitted a description of the economies resulting from the application of oxyacetylene welding to the construction and repair of steam, air and other pipe lines. In this discussion the weakness of screw joints was pointed out and was illustrated with a number of photographs and drawings. It was emphasized that good results are obtained by substituting:

(1) Welded joints for screwed joints in smaller pipe lines.

(2) The more general use of improved flanged joints on larger pipes under low pressure, to say nothing of the positive necessity for them in high pressure lines.

(3) The use of long sweep bends and elbows to take care of expansion instead of the primitive double swing or the complicated patent slip expansion joint.

Discussion

J. V. Hanna (K. C. Ter.): I might say that we get a good deal of service from a device such as was just shown in making repairs. We cut rails. We cut bolt holes and repair frog points. The street railway companies repair frogs by taking a hard metal, hard steel of some sort—possibly they use electric steel—and they harden up these worn points right in the track without removing them.

A Weed Grader

G. W. Vaughan, engineer maintenance of way of the New York Central, submitted a description of a weed grader consisting of an attachment for a roadbed spreader to loosen up stone ballast and to destroy vegetation between tracks and on the shoulders. This grader can be operated at the rate of six miles per hour and, on the basis of eight hours per day, will cover 48 miles of track at an approximate cost of $31. It would require 10 men 6 days to clean one mile of track by hand. At present labor rates the cost of cleaning 48 miles of track would amount to $7,200. When in use the grader is swung at right angles to the track. It can be lifted over obstructions readily by the mechanism of the spreader.

Discussion

C. E. Lindsay (N. Y. C.): That weed remover was used primarily in stone ballasted track on the western division of the New York Central lines, in the vicinity of Batavia. It was designed by the superintendent of track, A. M. Clough. I cannot speak of my own konwledge as to the results attained. I have seen some of the track on which the apparatus has been used. It apparently loosens up the weeds and they die by exposure to the sun. Just how efficacious it is in ultimately killing the weeds, or whether it acts as a cultivator to promote the growth of weeds, has yet to be determined, but apparently it has considerable merit.

Melting Snow and Ice With Steam

C. A. Paquette, chief engineer of the Cleveland, Cincinnati, Chicago & St. Louis, presented a description of a hose attachment on an engine tender to permit snow and ice to be removed from frogs and switches by steam. A man at the rear of the tender regulates the flow of steam by means of a globe valve. Actual practice has demonstrated that two men can clean a switch in six minutes. The steam is of sufficient pressure to blow the water away from the switch points and prevent its freezing again. It has been found that two men with this equipment will do the work of 8 or 10 men under ordinary methods.

Mr. Lewis: On the subject of the use of steam for cleaning out snow and ice, I might say that we have for a long term of years used steam hose for other purposes in connection with snow and ice, thawing out locomotive water tanks, cleaning the snow and ice off the trucks of cars, and for the running gear of locomotives, and have found it even more successful there at times than for cleaning out switch points, because if the temperature is low enough the use of steam, and the resulting compensation, if you do not have perfect drainage, the water resulting from the use of steam is likely to freeze very quickly. It would not say that it is cold enough in the northern part of this country to freeze the steam into ice before it hits the switch point, but it is pretty nearly cold enough to do it.

Mr. Lindsay: I have used this winter in Albany an electrical device for thawing switches. It has been used very extensively on the New York Central in the electric zone, where power is easily accessible and comparatively cheap, and it has given remarkable results. In my case, I was using it experimentally, to see what it would accomplish in colder climates than the zone around the Grand Central Terminal, and we had two switches equipped with this device, which consists of a resistance coil buried in the ballast between the ties and the switch rods, to a depth of about three inches below the top of the ballast. When a storm starts the signal maintainer goes in and turns the switch, and after the switch has been on for a time the area of ground is warm enough so that you can feel it, and the current is left on until the storm subsides. During the winter we never touch these two switches, although we had an army of men on the others. In that particular experiment the cost of current was $25 per month per switch.

Mr. Ford: What did the installation cost?

Mr. Lindsay: I could not tell you that offhand. If you will write to Francis Borden, the division engineer of the Grand Central Terminal, he will be able to give you all the information you desire.

A Tractor for Railway Service

C. A. Morse, chief engineer of the Rock Island, spoke on the uses of tractors in railway work. He said in part: The proposition I am to present to you is the result of my spending my life on the granger roads. The result is that I have become somewhat of a farmer. Last fall I was over on the northwestern lines and we found a lot of work was being done that should be done, and we found that we were offering 60 cents an hour for farmers' teams for mowing rights of way, and matters of that kind, and could not get the teams. It also occurred to me that the farmers were substituting tractors for teams, and I wondered where we would be when the farmers got through with the teams and used tractors.

Returning home, I took the matter up to find out what there was in the way of a tractor that might be applicable to railroad work, and I finally got knowledge of a small caterpillar tractor, and I took up the matter with the parties manufacturing it, and I got some estimates and asked authority to purchase one. I figured in using it, to use it in connection with the shoulder ballast, and I hope to show you one before we get through with this meeting which is used a good deal in the northwest on level ballast, by which you can clean about ten miles of shoulder ballast a day and do it at one-tenth of what it would cost to do it by manual labor. Also it can be attached to a mowing machine, by which you can fix up the shoulder of the bank, or repair a ditch, or plow ditches, or use it as a scraper, or do anything of the kind that you desire.

I finally persuaded the makers of the tractor to take an interest in the matter of constructing tractors for railway work. I got them to ship one of these tractors to the Exhibit, and send their advertising man down here to show some slides and to explain a little in regard to it. My idea was when this was done we could judge for ourselves whether or not it was applicable to railroad work and maintenance work.

After the talk a number of slides were thrown on the screen illustrating the Cleveland tractor.

A Derrick Car

G. W. Vaughan, engineer maintenance of way of the New York Central, submitted a description of a ten-ton derrick car which was first developed on this road in 1910. The car consists of a steel platform approximately 40 ft. long, supported on two 4-wheel standard M. C. B. trucks. A boom and supports, together with engine, coal and water pockets are placed on the platform. The boom consists of 10-in. channels thoroughly braced with channel diaphragms and lacing and is approximately 22 ft. long to the main hoist and 30 ft. long to the auxiliary hoist. The boom is swung with a bull wheel which is equipped with roller bearings. The car is equipped with a 20-h.p. engine capable of a direct pull of 5,000 lb. It has a lifting capacity of 3,000 lb., with the boom at right angles to the car and working 28 ft. from the center line of the track. The car is operated by one man. When unloading rail, three men are required, one to operate the derrick car, one man to haul on the rails and another one to release the hook. From 150 to 400 rails can be unloaded per day.

Report on Economics of Railway Operation

A NEW COMMITTEE ON Economics of Railway Operation was created by the Board of Direction subsequent to the 1917 convention, to which it assigned the following subject: Study the relations between railway operation and the location, construction and maintenance of railways, and report on the possible scope and field of action which should be assigned to the committee on Economics of Railway Operation, and make such progress reports as are possible, in the order of relative importance.

The committee feels that its function should be the consideration of matters coming within the classification of "Transportation" together with such other matters as affect transportation costs, or as are affected by transportation methods. For instance, economics due to water treatment, which affects transportation expense, would involve a consideration of the maintenance and operating costs of water softening plants, etc.; this committee could use maintenance data secured from other committees in such cases in so far as possible. On the other hand, the matter of treating ties is one which does not affect any transportation costs, and should not come within the province of this committee. The subsequent use of the word "Operation" in this report is on the basis of this interpretation of the committee's duties.

At the initial meeting of the committee it was decided to be the sense of the committee that its scope or field include all matters affecting the operation of a railroad; but that for the present the committee confine its efforts to developing economy of operation of existing physical plants, including such additions as may be necessary for economical operation, but not including changes in alinement or grade reduction; that its efforts may be extended, from time to time, as the necessity or desirability arises; that as an essential preliminary it proposes to make an analysis of operating costs, as conclusions and rules cannot be arrived at without analysis of costs and the effect of capital expenditures.

An extensive Bibliography, prepared by the Library Service Bureau of the United Engineering Society and covering 12 subjects under 8 headings, was presented as an Appendix to this report.

Recommendations for Future Work

The committee recommends that the following topics be assigned for the ensuing year:

1. Collect data on operation costs from rate case investigations and any other available sources, and report on the additional investigations necessary to a complete analysis of operation costs. The committee on Economics of Railway Location should be conferred with by this committee.

2. Effect of variation in the speed of trains on costs of operation and maintenance.

3. Effect of the construction of additional main tracks on costs of operation and maintenance.
4. Economic length of operating districts.
5. Continue work on Bibliography.

Committee: F. W. Green (St. L. S. W.), chairman; V. K. Hendricks (St. L.-S. F.), vice-chairman; G. D. Brooke (B. & O.), Ralph Budd (G. N.), Maurice Coburn (P. L. W.), C. E. Denney (N. Y. C. & St. L.), J. M. Egan (I. C.), L. C. Fritch (S. A. L.), U. E. Gillen (G. T.), C. M. Himmelberger (C. R. R. of N. J.), M. V. Hynes (C. I. & W.), W. J. Jenks (N. & W.), Paul M. LaBach (C. R. I. & P.), Frank Lee (C. P. R.), J. deN. Macomb, Jr. (A. T. & S. F.), Jos. Mullen (C. C. C. & St. L.), R. J. Parker (A. T. & S. F.), Wm. G. Raymond (University of Iowa), H. E. Riggs (University of Michigan), S. S. Roberts, E. F. Robinson (B. R. & P.), L. S. Rose (C. C. C. & St. L.), Mott Sawyer (C. M. & St. P.), E. C. Schmidt (University of Illinois), J. E. Teal (B. & O.), G. S. Waid (S. P.), C. C. Williams (University of Kansas).

Discussion

(In the absence of the chairman, Mr. Breen, and the vice-chairman, Mr. Hendricks, the report was presented by S. S. Roberts, a member of the committee.)

Mr. Roberts: It is the thought of the committee that we should have the Board of Direction outline to it definitely the division between the work of this committee and that on Economics of Railway Location. It appears that the work in many respects overlaps, and we were not quite sure where the division should be drawn. We will be glad, indeed, to have suggestions, either now or in writing, as to what that division should be.

The President: The Chair would like to state as his personal opinion that this is one of the most important committees of our Association. Railways are in the transportation business. The work of this association for the past 19 years has been largely confined to the constructing of the machine by which the work is done. We have just awakened at this time that there may be a question as to how the work shall be done, and I would recommend to the Chairman of the Committee on Outline of Work that no obstacle be put in the way of the work of this committee and its further development.

H. R. Safford (G. T.): I think Mr. Roberts has stated that the Board of Direction should give a little more definite instruction than they have possibly done in the past, but we have been trying to feel our way a little with this committee. My thought is, speaking to the principal point that you made, which relates to transportation, that it is our duty as an association, to try to interest more transportation men to become members, and this is one of the committees with which the transportation men should be most closely related. At the present time I think that one of the greatest fields for this association to consider for committee work has been that related to the economics of railway operation, and in connection with that comes more or less the question of transportation.

Maurice Coburn (P. L. W.): There is one point about this committee and the Committee on Location, and that is the data that the Committee on Location needs for the solution of its problems is the same data this committee needs for the solution of its problems and both need the same information. To avoid wasted effort we will have to work together, and see to it that we do not duplicate effort in the same field.

C. P. Howard: It seems to me that this sub-committee has pointed out one thing which is eminently true, which we should all have known beforehand, and that is that the subject is tremendously vast and could be well divided between two or three committees.

As I understand the question, their idea is that the Committee on Economics of Railway Locations should take the first division of expense, that is the maintenance of way, and that they will give their efforts for the present to the second, which is transportation. I am unable to see how the economics of operation can be very much separated from the economics of location, unless you take the very broad field that this committee is to cover the whole subject and tell the people how to run the railroad. As a practical matter it seems that dividing the work among the two committees is all right, but they are obliged to work along parallel lines.

Mr. Roberts: One of the members of the committee at one of our meetings sized the situation up in this way —he said that heretofore the Committee on Economics of Location has considered which of two or more things was the most economic for one condition of use, and that our field was to consider which of one or more different usages was best for a given line.

Mr. Coburn: Some of us understand it. Before we can solve these problems we must know certain things about operating costs, and the information you need to solve operating problems is the same information the other committee needs to solve their problems of location, and the other committee came to a point where they found they were up against it, but there was a lack of definite, complete information, so that they could correctly solve their problem, and one of the first moves we have proposed is that we will take advantage of the expensive work being done in some rate cases, to see if there is anything in that that will be any help to this committee.

Mr. Roberts: I think the general idea of the committee agrees very closely with one of the former speakers, that the subject is wonderfully wide, and we would like to narrow it down so that we could get a good firm footing on which to make a start.

J. L. Campbell (E. P. & S. W.): It appears to me that there is a field for the work of this committee parallel to, and in correlation with, the work of the Committee on Economics of Railway Location, and that that field should be occupied by this committee. My view of the matter is, the economics of operation is the foundation on which the economics of railway location is to be determined. The problem involved in the economics of railway location is the question of finding the place on which to build the transportation machine, and the proper solution of that problem involves a knowledge of the elements of the economics of railway operation, possibly not a knowledge of all the elements, but certainly requires a good knowledge of many of them, most of the fundamentals.

It appears to me that the work of this committee in many important respects ought to precede the work of the Committee on Economics of Railway Location, and that this committee should be valuable in the determination of the economics of railway location, and it will be valuable if it provides this association and this Committee on Economics of Railway Location with such knowledge and information as may not be now available.

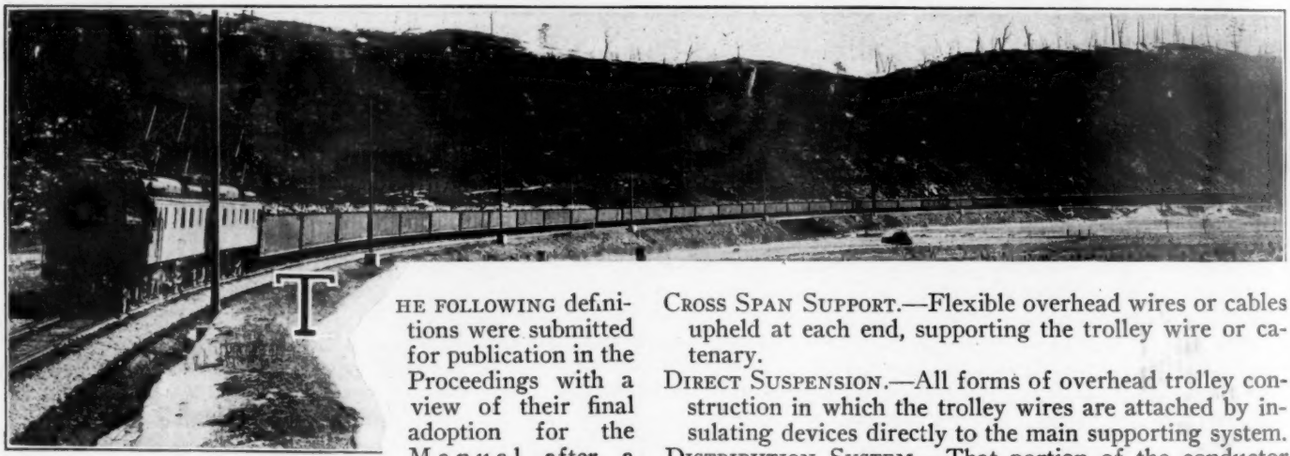
H. Churchill (N. & W.): I think this committee should take up these various economic questions which have been brought out by the several committees on maintenance in the first place, and then bear in mind that the unit of cost is the cost per ton-mile, and that unit cost per ton-mile applies to maintenance as much as it does to handling cars over the road. We have recognized that on the Norfolk & Western and worked to that for many years. It forms a possible solution for many questions that come up. In handling the traffic over the line, of course, the larger cars and the larger engines, without increasing the reloads at the same time, form the basis

for our gains. Electrification at certain points makes a large saving. This, however, is limited to points where density of traffic is great enough to warrant it, but I believe as the others have said, that there is a direct work for this committee to do, and they can get information from various roads that will show, irrespective of the increases of labor, that economies are obtained by different railroads.

The President: The Committee on Outline of Work will take careful consideration of the suggestions made by the committee, and I believe that if this committee has some difficulties in starting they will overcome them and make one of the most important committees the association has.

(The committee was dismissed with the thanks of the association.)

Report of Committee on Electricity



THE FOLLOWING definitions were submitted for publication in the Proceedings with a view of their final adoption for the Manual after a year's trial. These definitions, so far as possible, conform with those adopted by the U. S. Bureau of Standards, printed in the National Electric Safety Code, and those of the American Institute of Electrical Engineers. It is recommended that the definitions be adopted tentatively, with the understanding that they will be reconsidered in the light of suggestions which may be received during the coming year.

BOND.—A metallic means for connecting two rails to permit of passage of electric current.

BONDER.—An employee qualified to install or maintain bonds and their appurtenances.

BRACKET SUPPORT.—An arm supporting the trolley wire or catenary.

BRIDGE SUPPORT.—A rigid overhead structure upheld at each end, supporting the trolley wire or catenary.

CABLE.—Wires bound together, acting as a conductor.

CATENARY SUSPENSION.—All forms of overhead trolley construction in which the trolley wires are attached to one or more supporting cables, which in turn are attached to the main supporting system.

CLEARANCE LINE (EQUIPMENT).—The line beyond which no part of the equipment shall project. Allowance must be made by equipment manufacturers for new equipment for wear on journals and brasses on axle collars, on rails, on wheels, compression of springs, sagging of center of car, constructional variations, end play, broken springs, etc.

CLEARANCE LINE (THIRD RAIL).—Lines beyond which no part of the third rail structure shall project.

CONDUCTOR.—A continuous metallic path for the flow of electricity.

CONTACT CONDUCTOR.—That part of the distribution system other than the traffic rails which is in immediate electrical contact with the circuits of the cars or locomotives.

CONTACT RAIL.—A rigid contact conductor.

CONTACT RAIL (OVERHEAD).—A contact rail above the elevation of the maximum equipment line.

CROSS SPAN SUPPORT.—Flexible overhead wires or cables upheld at each end, supporting the trolley wire or catenary.

DIRECT SUSPENSION.—All forms of overhead trolley construction in which the trolley wires are attached by insulating devices directly to the main supporting system.

DISTRIBUTION SYSTEM.—That portion of the conductor system which carries current of the kind and voltage received by the cars or locomotives.

DUCT LINE.—A structure consisting of one or more pipes laid up in banks in which may be placed wires or cables.

ELECTRICAL SUPERVISOR.—An official of the division staff, qualified to supervise the maintenance of the electrical transmission and working conductors, outside of the power stations and sub-stations.

JUMPER.—A cable used to connect the ends of two contact conductors.

PATROLMEN.—Employees qualified to inspect and make minor repairs to track and third-rail structure, cables and wires, and to use hand signals for the protection of trains.

PULLING CHAMBER.—A chamber similar to but smaller than the splicing chamber, and used primarily for pulling cables and wires into ducts.

SPLICING CHAMBER.—A chamber in a duct line where cables are spliced and inspected.

SUB-STATION.—A group of apparatus or machinery which receives current from a transmission system, changes its kind or voltage and delivers it to a distribution system.

THIRD RAIL.—A contact conductor placed at either side of the track, the contact surface of which is a few inches above the level of the top of the track rails.

THIRD RAIL GAGE.—Distance measured parallel to plane of top of both running rails between gage of nearest running rail and inside gage line of third rail.

TRACTION LINEMEN.—Employees qualified to maintain wires and cables and their appurtenances for all railroad voltages.

TRANSMISSION SYSTEM.—That portion of the conductor system carrying current of a kind or voltage defferent from that received by the cars or locomotives.

TRANSMISSION LINE.—A system of towers or poles and cables or wires carrying current from the source of power to the sub-stations.

TROLLEY WIRE.—A flexible contact conductor customarily supported above the cars.

Water Power

The committee is of the opinion that all water power developments, both from the point of view of generation and utilization, are subject to such wide variations, both physical and operative, that every situation is individual to itself; and it is the committee's conviction that now, as never before, there is reason for railroads to investigate anew the financial possibilities to be gained by the development of some of the water powers within their territories, which, under past conditions, may have been considered unprofitable.

The committee reported progress and suggested the following underlying principles as governing a choice between steam and water power developments, or the use of combined water and steam plants.

1. The increased cost of coal, being the largest single factor of cost, outside of fixed charges, in the production of steam generated power, places such higher values upon hitherto undeveloped water powers.

2. Water power on rivers, the average stream flow which can be increased by storage, may now figure attractively against steam generated power in some locations.

3. Water powers on rivers from which continuous flow cannot be obtained may now figure attractively in combination with steam plants against steam development alone.

Proposed National Electrical Safety Code

The preliminary edition of the proposed National Electric Safety Code was issued April 29th, 1915, and submitted for criticism by Dr. E. B. Rosa, Chief Physicist, U. S. Bureau of Standards, Department of Commerce, Washington, D. C. Since that time the code has been the subject of discussion by the officers of the Bureau of Standards and by the representatives of the national engineering societies. The object of the code is to prescribe good electrical practice for all industries, including railroads, and will be recommended by the Bureau of Standards to the various public service commissions and other state legislative bodies for adoption as mandatory law. The second edition of the code was issued November 15th, 1916, for examination, trial and constructive criticism. The most serious defect in the code relates to the requirements for the crossing of foreign wires and cables over railroad company's rights-of-way. The standards used for many years by the railroad companies have been reduced in some important details, as will be shown in the comparison of the A. R. E. A. specifications for overhead transmission line crossings.

General Conclusions in Regard to the Code

1. That the general principles of the code are acceptable and desirable as tending to establish uniform electrical rules in the several states of the Union.

2. That the code is cumbersome and overburdened with cross references and would be made more useful if separated into several pocket-size pamphlets to cover each of the industries.

3. That the requirements of the code pertaining to the crossing of railroad company's rights of way by electric cables and wires are deficient and below the specifications of the American Railway Association, the American Railway Engineering Association and the American Electric Railway Association, and should be revised upwards.

4. That the legality of the code should be established by the opinion of an authority high in the Federal Government.

Recommendations

1. The committee recommended the tentative adoption and publication in the Proceedings of the Electrical Definitions.

2. Acceptance and publication in the Proceedings, as information, of tabulated statements showing third-rail clearances and data relative to overhead clearances on railroads, revised up to November 1, 1917. Continue the subject next year.

3. Acceptance and publication in the Proceedings, as information, of the report on Catenary Construction.

4. Acceptance and publication in the Proceedings, as information, of the report on Electrolytic Effect on Concrete in Salt Water, and a continuation of the general subject of Electrolysis, with the sending of authorized representatives to the American Committee on Electrolysis; and asks for further instructions in the matter of a report on Insulation.

5. Acceptance of the progress reports on Maintenance Organization, Water Power and Electrical Interference, with a continuation of these subjects.

6. That the report on the National Electrical Safety Code be accepted and published in the Proceedings, as information, and that the committee be authorized to send delegates to present a copy of this report to the Director of the U. S. Bureau of Standards, Washington, D. C., and to object to the provisions of the National Electrical Safety Code, which tend to reduce the present requirements of the A. R. E. A. specifications for overhead and underground wire crossings, where the safety of life or property is involved.

7. That the Contract Form on Location of Power Lines and Wires on Railroad Company's Rights of Way be referred to a committee composed of members from the proper standing committees of the American Railway Association and of the American Railway Engineering Association.

Committee: Edwin B. Katte (N. Y. C.), chairman; A. G. Shaver, vice-chairman; A. H. Armstrong, H. M. Bassett (N. Y. C.), Z. M. Briggs (P. L. W.), D. J. Brumley (I. C.), R. D. Coombs, A. O. Cunningham (Wabash), Walt Dennis (Wabash), R. H. Ford (C. R. I. & P.), W. F. Graves, George W. Kittredge (N. Y. C.), C. E. Lindsay (N. Y. C.), W. L. Morse (N. Y. C.), W. S. Murray, J. A. Peabody (C. & N. W.), Frank Rhea, J. R. Savage (L. I.), M. Schreiber, H. U. Wallace.

Discussion

E. B. Katte (chairman): Ten subjects have been assigned by the Board of Direction to the Committee on Electricity, and these subjects have been considered by seven sub-committees. Three of the sub-committees are merely reporting progress, and the others are submitting reports which are briefly as follows:

The revision of the Manual is entirely confined to the suggestion of 28 electrical definitions. Some of them are already contained in the Manual, but are slightly rearranged. Others are proposed definitions, while still a third class are definitions that have been taken from definitions of the Institute of Electrical Engineers. The committee in this connection recommends not the formal adoption at this time of these definitions, but rather that they be tentatively accepted for the year, and that during that period those with suggestions to offer send the revised definitions to the committee, and they will be considered in time for final action the following year.

The Committee on Third Rail and Overhead Clearances submit practically a progress report, with tables showing third rail clearances and overhead clearances.

The Transmission Lines and Overhead and Underground Crossings Committee have submitted a report on Item 5, Item 5 being on the proper type of overhead catenary construction, with particular reference to the consideration of providing clear vision for signals, co-operating with the committee on signals and interlocking.

A special subject was assigned during the summer by the secretary to this committee, being a contract form on location of power lines and wires, on railroad companies' right-of-way. The committee was not able to get very far on this, and believes that it is a subject that should be assigned to standing committees of the two associations, and your committee recommends that this be referred to a committee composed of members from the proper standing committees of the American Railway Association and of the American Railway Engineering Association.

The main subject that is in the report is the proposed national electric safety code. The code as a whole has been very favorably received by all of the railroads. It is a very helpful and a very good work. Railroad engineers really only have two objections to make, and these objections have consistently been made ever since the code was first considered. The first is clearances. The code proposes to reduce railroad standard clearances.

The second objection is a structural objection. The code permits lighter structures carrying wires over railroad companies' rights of way, and your committee feels that the code, representing a government document, should not reduce railroad standards. The code is a safety code. Our crossing specifications are distinctly crossing specifications. They do not interfere one with the other.

(Mr. Katte, after reading the matter headed "General Conclusions in Regard to the Code," stated that the code was a voluminous publication and that while it is a very safe guide for electrical construction work, due to the cross references, it was too difficult for the average railroad engineer to use as a specification. Five recommendations were then presented and acted upon by the convention.)

Morton G. Lloyd (U. S. Bureau of Standards): In regard to the comparison which is made in this report between the Joint Specification and rules of the Safety Code, there are a few matters I want to point out only as illustrative that this comparison is not as accurate as we would like to have it. In regard to the provisions for heavy, medium and light loading, our code takes account of the differences in the climatic conditions between the different parts of the country. It provides in territories with medium loading the loading requirements shall be only two-thirds as great as that for heavy loading, and that in the case of light loading it is only to be two-thirds as great as in the medium district. The committee evidently thought we were taking one-third off for the medium and one-third for the light, and stated we had only one-third left.

Another matter is regarding the factors of safety given in this comparison which are quite erroneous. One thing stated is that we only require a factor of safety of one for steel. The Code very distinctly specifies that the stress to be used shall be 27,000 lb. How the committee got a factor of safety of one out of that I am not able to say. The factor of safety for wood poles is stated to be two. That is correct in a sense, and yet very misleading in another sense. The same thing is true of concrete poles.

Another thing to be remembered there is that the Joint Committee specification has not any requirement whatever as to maintenance. We permit them to build a weaker line, but require them to maintain it at a strength where it will do the work required. That seems to us a much more reasonable requirement and a much safer one for you as well as for the general public.

In view of these matters and these positively erroneous items of comparison, I think it would be very regrettable if that part of this report were passed to final publication as it now stands. As to our strength specifications, I might point out that they also are minimum requirements. What we have done is to draw up a Code of rules which, when finally revised, will be effective as far as possible and we hope will be suitable for the mandatory requirements that may be made as an official order by state commissions or other administrative bodies who have jurisdiction over this kind of construction.

One other thing that is not at all in the joint committee specifications, which we consider very important, is the matter of provision for the safety of the men who are doing the work. In that connection I will say that any code of this kind which is developed with the idea of being eventually made a local standard has got to cover points of that kind. State commissions are deeply concerned with the matter. A specification which does not cover these items is, from their point of view, as well as ours, very defective and unsuitable for the purpose.

Mr. Katte: I don't think there is anything that Mr. Lloyd brought out that has not been considered by your committee, not only at this time but during the past three or four years. Your committee, by representation and by individuals, have been to Washington twice. There is no antagonism on the part of the committee to the Code. The committee is strongly in favor of it. If there is anything in the Code that will strengthen our specifications, we will recommend it to you for adoption. It is the items of the Code that reduce your specifications that we object to. The two principal items are clearances and factors of safety.

The objection to our specification is made by the National Electric Light Association. These men want to cross our railroads with their standard construction. They cannot afford to build their entire line as strong as that line ought to be where it crosses a railroad, no matter whether it is a branch line or a trunk line railroad. The construction should be stronger at railroad crossings than throughout the country.

In the matter of comparison between our specifications and the Code, it is naturally very difficult to compare a precise specification with a very general statement of safety requirements. The Code is not a specification. It is a very general statement of good common practice. We will all follow that Code, but we want to follow the best parts of the Code, not the minima.

The other speaker said that our specifications are not up to date. They are not up to date. The last report was made in 1915, and that revision was merely minor changes. Your committee intends to revise this specification and make it more logical and easily read and interpreted.

Regarding the legality of the Code, there are portions of the Code which are merely constructional which can be enforced legally, there is no question about that. But part 4 is the principal part the lawyers have questioned. They brought out the point that when inspection is made mandatory, that the municipality or United States government appoints the inspectors, as in the case of fire inspection, city police inspection of boilers and electric light installation inspection.

Regarding the structural features of factors of safety, Dr. Lloyd is quite right regarding our contention. It

is our impression that the Bureau of Standards is trying to make the plans between the strong specifications the railroads require for their own structures, and the somewhat lighter construction which the National Electric Light Association permits for their line construction generally. He has proposed a balance between the two.

F. Auryansen (Long Island): I would like first to call your attention to Rule 201 of the Code, which provides that the minimum requirement in the Code may be waived.

To get down to specific examples, this association's specification for structural steel is 18,000 lb. for tension, and corresponding values throughout; whereas the Code increases that figure 50 per cent on the basis of increasing the wind load from 8 lb. to 12 lb. in what is called the heavy loading territory. That is not strictly a 50 per cent increase of both load and stress, because the dead load and the ice load are constant, so that as you increase the stress in the steel you are diminishing your factor of safety.

The Code specifies 700 lb. as the strength of cross arms, pins, etc., in one place, and in another place it says that the entire pulling of the wires shall be provided for. Those are two directly contradictory statements, because the pull in a wire may be very much more than that.

Regarding the minimum requirements, I think there are very few here that would adhere to those. When we are building a line of this character for ourselves we certainly must take full account of probable growth for a number of years.

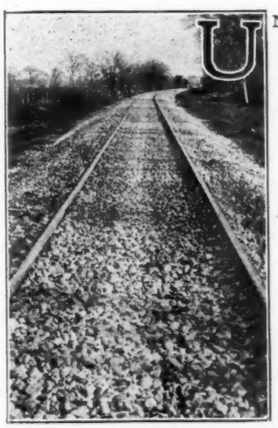
The clearance, which may be cut down to 25 ft., according to the Code, is too low. There is the possibility of a cross arm burning, so that instead of a single span you may have two spans combined into one, with a very much larger sag.

The President: I would like to give a little experience that we had in the northwest. In January last we had a rain followed by a cold spell, and for a distance of 35 miles the moment the rain touched any solid matter it turned into ice. All of the telegraph wires were broken in that district. Of course, against a catastrophe of that kind, nobody could have any reasonable factor of safety. The telegraph line that came down weighed seven pounds per running foot. That means it was four or five inches in diameter, and the power wire, being much heavier, would be correspondingly greater with the ice on it.

This subject is not a quarrel by any means between the Bureau of Standards and this committee. Our interest lies in protecting ourselves against construction companies or electric companies that may take advantage of rules that you might promulgate.

(After some further discussion the President stated that the Board would approve the suggestions of the committee, which was excused with the thanks of the association.)

Report of Committee on Ballast



UNDER THE HEADING "Depth of Ballast" in the Supplement to the Manual as published in Bulletin No. 197, Vol. 19, insert the word "proper" after the first word "the," making the paragraph read, "The *proper* depth of ballast under the tie," etc.

Additional Definitions

SKELETONIZING TRACK.—The digging out and removal of all material from over and between the ties down to a level with or below the bottom of the ties.

SHELL BALLAST.—A ballast composed of marine shells of all kinds which are washed into heaps in the shallow water along the Gulf Coast. These shells, for use as ballast, mixed with small per cent of sand, are secured by dredging.

GRANULATED SLAG.—Granulated slag is the product of the blast furnace, formed by having a jet of water injected into the molten slag as it runs from the furnace. This treatment reduces the slag to a granular form.

BLAST FURNACE SLAG.—Slag from blast furnaces, which is poured out as molten slag and allowed to cool. It is then broken up by blasting or otherwise, for use as ballast. This type of slag is of a light gray color, is quite porous and lighter in weight than majority of stone ballast.

OPEN-HEARTH SLAG.—Open-hearth slag is a product of the open-hearth steel furnaces, is very black and dense, and contains a considerable quantity of iron, is quite heavy, and breaks in angular form, and therefore makes excellent ballast.

PRECIOUS METAL SLAG.—A slag from smelters for reducing precious metals; is very similar in appearance and consistency to the open-hearth slag. The precious metal slag is usually black or very dark in color, is very hard and heavy, and, when properly crushed, makes an excellent ballast.

VOLCANIC CINDERS.—Volcanic cinders are the cinders thrown out by volcanic eruptions and deposited in hills and mountains, partially free from lava. In appearance, they are much like "burnt clay" or "gumbo" ballast, but are usually darker in color, and much harder and more durable.

Methods and Cost of Applying Ballast

Mechanical devices used to save labor and expense and to expedite the work fall naturally into sequence from the pit, quarry or ballast pile to the finished track. Cars for transporting ballast should be carefully chosen with regard to the work to be done—whether it is to be on track already laid or for an additional parallel track.

If for raising track, hopper cars should be used with the ballast plow or tie drag. If for parallel track side dumps are to be preferred, especially when air operated. Convertible cars where the sides swing out and up, when used with the side plow and unloading engine-drum and cable, are fairly satisfactory when dump cars are not available, which is usually the case when stone ballast is furnished from a private quarry. Anchoring the train and pulling the plow through the train by cable from the locomotive is a poor substitute for the unloading engine. It does beat unloading by hand.

The spreader car, especially when air operated, is effective and should be in general use. With this car, ballast for new second track work previously dumped alongside the running track from side dump cars or unloaded by side plows, can be spread out to a grade two inches below the bottom of tie and to the outside shoulder at a

speed of eight miles per hour. When not in use on ballast work the spreader can be used on a grading dump and in wet clay or rock will do the work of 50 men and remain idle most of the time at that.

The only other mechanical tool which seems to require particular mention is the mechanical tamper. This tool has passed the stage where its usefulness under favorable circumstances needs further defense. Around terminals and yards where there is a large amount of frog and switch work, so far as this committee knows, there is no disposition to question the expediency of its use based on its merits alone, entirely apart from any question of scarcity of labor. Opinions differ as to the amount of labor the mechanical tamper will save. It is probably conservative to say that a gang consisting of 1 foreman and 12 men, with 4 pneumatic tampers can do as much work in a day as 20 men with picks or tamping bar, and do it better. Some supervisors set the figure much higher in congested territory.

An outline of a typical four-unit and two-unit gang follows:

Maintenance Gang for Pneumatic Tamper

Four-Machine Outfit	Two-Machine Outfit
Foreman:	Foreman:
1 Compressor runner	1 Compressor runner
2 Hose and utility men	1 Hose and utility man
4 Tampers	2 Tampers
4 Shovel and bar men	2 Shovel and bar men
1 Lookout	

In either case on maintenance work it is assumed that the whole crew working as a unit would renew ties, clean out for tamping and do other preliminary work in advance of the machines. It should be borne in mind, however, that the outfit required with mechanical tampers is complicated and will break down if not properly handled. It is a gas engine and is susceptible to all the potential troubles that go with an automobile, substituting hose troubles for tire troubles. It is an air compressor and requires the same care and is susceptible to the same troubles as any other compressor. The tamping tool is much like a "Jap" Drill and has its own peculiar troubles.

When used at a terminal when the apparatus can receive proper attention from a mechanic, these troubles are not serious. When sent out on a section and left to the tender mercies of the average foreman of an outlying section gang, unless regularly inspected and "tuned up" by someone having the necessary mechanical knowledge not only to put the outfit in shape, but to instruct the foreman in its use, it is liable to be out of order, and consequently out of service a considerable portion of the time.

The carriers were circularized about ballasting by contract and were asked to give the committee their views in regard to the practicability and the desirability of contracting for the application of ballast: (a) On new construction, and (b) on an operated line, first stating whether they had or had not handled ballast work by contract in recent years under either or both of the two classes.

One hundred and seven replies were received in connection with new work. Of this number 18 replied that they had within recent years handled ballast work by contract on new construction, 9 were in favor of continuing such method of procedure, 6 were non-committal, and 3 were opposed. Of the 86 who had not within recent years handled ballast by contract on new work, 13 were in favor of trying such a method, 36 were non-committal and 37 were opposed.

One hundred and three replies were received in connection with contract ballasting on an operated line. Of the 6 who have within recent years handled ballast by contract on operated lines, 2 were in favor of continuing such practice, 3 were in doubt and one opposed. Of the 87 who have not within recent years handled ballast by contract on an operated line, 8 were in favor of trying such procedure, 32 were non-committal, and 57 were opposed.

On new lines the arguments in favor of contract work as brought out by the replies were two:

1. Flexibility of supply and control over labor owing to freedom in fixing rates of pay.

2. A possible low price owing to some local condition, such as lack of proper equipment on the part of the carrier.

The disadvantages were:

(a) Loss of control over the work.
(b) Less thorough work even under close inspection.
(c) The ultimate cost may be increased.
(d) Dispute over the character and sequence of the work.
(e) Dispute over distribution of ballast.
(f) Dispute over whether or not contractor has fully performed his duty.

On an operated line the same two reasons favorable to ballasting by contract will apply as in the case of a new line.

The same objections are raised and in addition the following are cited:

(g) Some added danger owing to loss of direct control.
(h) Less complete co-ordination between the constructing and operating forces.
(i) Greater interruption to traffic.
(j) Claims for extras on account of interference with the work.
(k) Difficulty of ensuring the maintenance of a surface in the working sector that will prevent surface bending the rail.

Conclusion

The consensus of opinion expressed is strongly against ballasting by contract in normal times and especially so on an operated track. Advocates of ballasting by contract do so largely as an emergency measure because of the greater flexibility of a contractor's organization in changing the rates of pay and so securing labor in time of stress. The matter is best summed up in the language of one of the men listed as favorable to this method. He says:

"My experience on this and other railroads is that contract ballasting * * * is to a large extent a necessary evil."

Comparative Merit of Different Stones and Gravel and Other Material for Ballast. Physical Tests of Ballast

Under date of July 24, 1917, approximately 30 carriers were requested to list the various ballasts used of each kind in the order of their effectiveness and the answers of sixteen are tabulated in an appendix to the report. At the meeting in March, 1917, the Association approved the recommendation of the Ballast committee on the order of effectiveness of the various kinds of ballast and the committee has endeavored to obtain from the data in the

appendix the order of effectiveness of the various classes of each kind of ballast as follows:

CONCLUSIONS.

(1) Stone.
  (a) Trap rock.
  (b) Limestone.
  (c) Sandstone.
(2) Washed Gravel.
(3) Broken Slag (not granulated).
  (a) Precious metal slag.
  (b) Open-hearth slag.
  (c) Blast furnace slag.
(4) Pit Run Gravel.
  (a) River or stream gravel.
  (b) Hill gravel (not cementing).
  (c) Hill gravel cementing.
(5) Chatts.
  (a) Chatts from zinc ore, which is coarse.
  (b) Chatts from lead ore, which is fine.
(6) Burnt Clay or Gumbo.
(7) Cinders.
  (a) Hard coal cinders.
  (b) Volcanic cinders.
  (c) Soft coal cinders.

The committee obtained from the Library Service Bureau of the United Engineering Society, New York, a list of publications on "Ballast and Ballasting." This is not a complete bibliography, but it is a continuation of a search made on the same subject in the library of the American Society of Civil Engineers on October 10, 1906.

Ballast Sections, With Particular Reference to Sub and Top Ballast

The committee made a composite drawing of the ballast sections of 10 principal roads. Through this composite drawing was drawn in red the outlines of the Class A track sections recommended by the committee for 24 in. of ballast to indicate to the members of the Association how the proposed new section compares with other sections now in use. The committee feels that the Class A section should have 24 in. of ballast under the tie as compared with 12 in. shown in the 1915 Manual, page 55. To agree on all the points at one time is rather difficult and, therefore, the committee divided the section into its parts in the following diagram for the purpose of reaching a conclusion on each part separately.

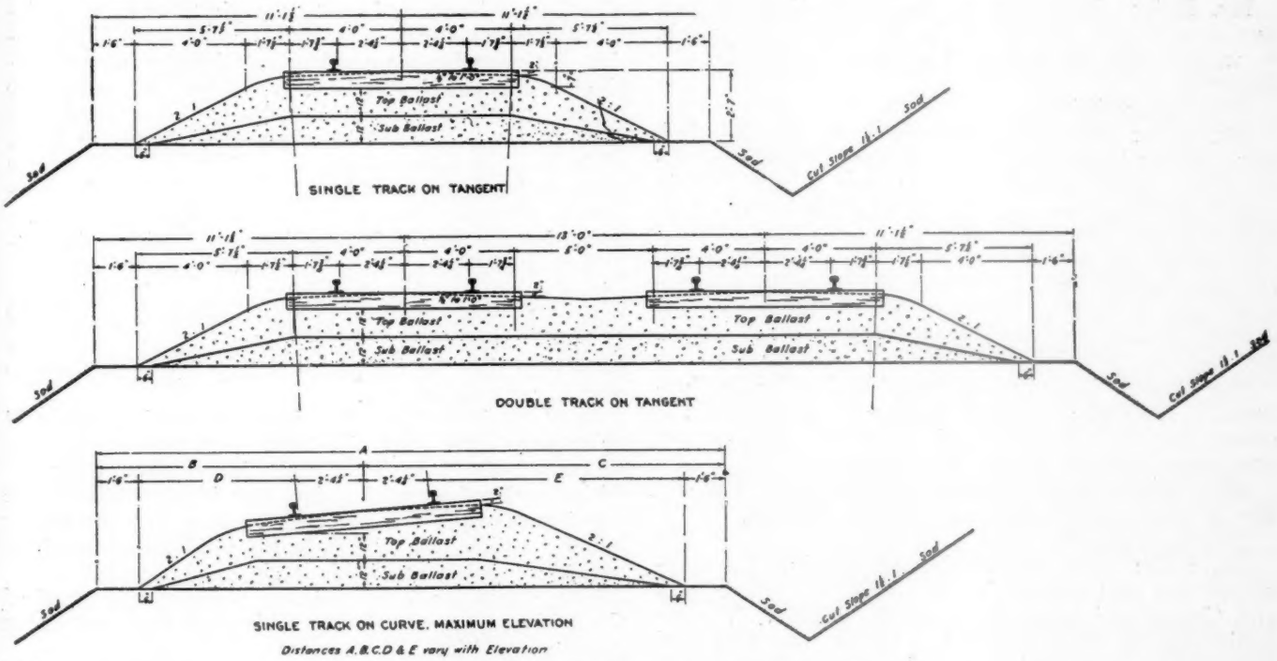
The committee recommended that the ballast cross-section shown be adopted for "Class A track with 24 in. of ballast."

Conclusions

The committee recommended:

1. That the changes in the Manual be approved.
2. That the additional definitions be approved and published in the Manual.
3. That the phraseology in regard to "Physical Tests of Ballast," be approved for the Manual.
4. That the ballast sections be approved and published in the Manual.

Committee: H. E. Hale, chairman; J. M. Meade (A. T. & S. F.), vice-chairman; C. W. Baldridge (A. T. & S. F.), J. S. Bassett (M. P.), W. J. Bergen (N. Y. C. & St. L.), H. E. Boardman (N. Y. C.), C. J. Coon (N. Y. C.), T. W. Fatherson (C. G. W.), G. H. Harris (M. C.), F. A. Jones (M. P.), J. S. McBride (C. & E. I.), William McNab (G. T.), F. J. Parrish (C. H. & D.), S. B. Rice (R. F. & P.), H. L. Ripley (N. Y. N. H. & H.), H. E. Stansbury (E. P. & S. W.), Paul Sterling (N. Y. N. H. & H.), F. J. Stimson (P. L. W.), D. W. Thrower (I. C.), W. Trapnell (C. & C.), D. L. Sommerville (N. Y. C.), W. K. Walker (Wab.), R. C. White (M. P.), W. D. Williams (Cin. Nor.).


Top Ballast
Sub Ballast
Sod
Cut Slope 1½:1
SINGLE TRACK ON TANGENT
DOUBLE TRACK ON TANGENT
SINGLE TRACK ON CURVE. MAXIMUM ELEVATION
Distances A, B, C, D & E vary with Elevation

Recommended Sections for Stone Ballast on Class A

Discussion

H. E. Hale (chairman): The first part that is of interest will be found under the head of Miscellaneous. The committee was fortunate to obtain a copy of the Pennsylvania Railroad's specifications for stone ballast. The most interesting part of these specifications is the inclusion of physical tests for stone ballast. This is the first case of the physical test being included in a specification that the Ballast committee has found.

The committee was assigned the question of proper depth of ballast of various kinds to insure uniform distribution of loads on the roadway. No conclusion could be reached by the committee, on account of the fact that the committee on Stresses in Track had not completed its report. We must wait until that committee has the report completed.

Under the heading of Methods and Cost of Apply-

ing Ballast is given a proposed typical gang for ballasting. Your committee feels that more economy can be gained by proper organization of ballast gangs than any other subject that has been given to the Ballast committee. We have been able this year to include several different organizations used by different railroads, and have presented them simply as information, with the hope that we will get from other carriers additional gangs or organizations, so that we can in the coming year give you a definite recommendation. That given is rather tentative. The conclusions are simply to carry this question over until next year.

The next subject given to the committee was the use and limitation of mechanical tools. We have just given you moving pictures of one of the principal mechanical tools, and our conclusions are in the report which we propose be printed in the Manual.

(It was moved and carried that they be put in the Manual.)

Mr. Hale: In regard to the mechanical tamper, our conclusions are given in the third paragraph. I would like to move that that be put in the Manual.

(Motion carried.)

Mr. Hale: We have received from time to time some rather interesting data on the cost of the mechanical tamper. Some of it has been printed in this report and previous reports. It was quite discouraging, and the committee felt it was due to the method of keeping the record. However, they felt that the members of the association would like to have some data on cost, and we did not try to summarize it or average it, but simply reported it to you as received by us.

The next subject given us was "Ballasting by Contract." We had quite a difference of opinion on the committee, and the conclusions of the majority of the committee are printed in the report.

(Mr. Hale read the first two paragraphs.) I would like to move that those be put in the Manual.

(Motion carried.)

Mr. Hale: The next subject assigned to the committee was on Comparative Merit of Different Stones and Gravel and other Material for Ballast. The effectiveness of different kinds of ballast was approved last year by the association, and the committee would recommend that this be included in the Manual as written.

(Motion carried.)

Mr. Hale: In regard to the subject of physical tests of ballasts, there is one recommendation for the Manual.

(Mr. Hale read the first paragraph.)

The committee would like to have that in the Manual, because that bulletin has a great many tests carefully tabulated, and anybody that is studying the tests of stone ballast will get some good information, not only in the eastern part of the country, but from all parts of the country.

I move that that be put in the Manual.

(Motion carried.)

Mr. Hale: The last subject assigned to the Ballast committee was Ballast Section, with particular reference to sub and top ballast. Your committee has had this subject up for several years, and each year they have recommended some section and it has not been approved. The Ballast committee now comes back with the same section recommended to you. The committee itself was not able to agree until we divided the section into three parts. When this was done there was very little difference of opinion when we realized it was necessary to have 24 in. of ballast under the ties.

Mr. Ford: As I understand the recommendation of the committee, they are seeking to have adopted here a standard ballast section for Class A traffic. I haven't any particular fault to find with this section for some railroad, but I do think it is unfortunate for this association to go on record as commiting itself to any particular ballast section.

Mr. Lindsay: In support of Mr. Ford I would like to call attention to what the committee says: "The Ballast committee is not in a position to recommend any addition or changes in the matter in the Manual under the heading of 'proper depth of ballast.' The committee therefore recommends that this subject be reassigned for the coming year's work." And yet in the picture they show a definite depth ballast.

Mr. Hale: That is quite true, and the committee feels that both those statements are correct. The one is the question of the proper depth of ballast for uniform distribution of loads, and on that subject we have no information, or really we have quite a good deal of information, but not what we consider sufficient to make a definite recommendation. In this section the committee recommend the ballast cross section as shown be adopted as Class A track with 24-in. ballast. We specify 24 in. of ballast. We have quite a number of roads with a great deal more than 24 in. In fact, 24 in. is quite common on our trunk lines, and yet the association has shown no section for over 12 in., and instead of being objectionable in valuation work, we were confronted at one time with the question that everything under 12 in. would not be considered ballast, because this association only showed 12 in. of ballast in their cross section. It appears to your committee that the committee is very lax in not recommending a 24-in. section.

H. R. Safford (G. T.): It has been, I think, nearly 14 or 15 years since the 12-in. ballast section in the Manual was adopted. I have no hesitation in supporting the 24-in. section, because I believe that if we will only take cognizance of the increase in locomotives and cars in that length of time we will find that 24 in. is just about necessary. I hope that this motion will prevail.

The President: They are not asking the approval of the 24 in. They are simply asking for approval where you do use 24 in.

Mr. Ford: I am not objecting to any question of 12 in. or 24 in. or any other depth, but I do object to the specific dimensions that are shown as being the outline for the standard ballast section when 24 in. of ballast is being used. I want to make it clear there is no question of 24 in. at all, or any other depth that I object to.

Mr. Hale: If that is the case, we have quite a number of ballast sections in the Manual, and if it is against recommending a specific section, then, as I understand it, Mr. Ford, you would recommend that those sections now in the Manual be taken out.

Mr. Ford: I don't believe that the recommendation of the committee should be agreed to, for publication in the Manual,

Mr. Pickles: I think the form of the section is all right. Why not make it apply to ballast available, so it would answer in any depth of ballast?

Mr. Hale: That is the idea, that we have to get more than 12 in. under certain conditions. We know that 24 in. is used. What we would like to do is to put up a section that, if 24 in. is necessary, this is the proposed section, not recommend definitely 24 in., because we could not pass it. We know that the association would not approve it. If the wording which the committee has recom-

mended is not satisfactory to the association, we would be glad to change that; in fact, we would change anything at all in this section the association desires. But the committee strongly recommend that some section be shown in the Manual with 24 in. It is possible that a railroad will want 18 in. and they could very easily split the difference between the 12 in. recommended and the 24 in. recommended.

(Mr. Hale's motion prevailed unanimously and the committee was dismissed with thanks.)

Report on Uniform General Contract Forms

THE PREPARATION of a form of agreement for industry tracks has recently become a matter of interest and attention before a number of different railway associations. This committee learned that it has been the subject of consideration by a committee of the Railway Development Association, composed of representatives of industrial departments of railroads, for quite an extended period. It has also recently been under consideration by other associations, including the General Managers' Association of New York, and by the presidents and executives of the railroads centering in Chicago.

Members of this committee present at its first meeting of the current season in New York City felt that an effort should be made to secure joint action between the Railway Development Association and our Association relative to the preparation of a standard form of agreement for industry track. Arrangements were therefore made for joint meetings of committees of the two associations. Three such meetings have been held and the form herewith submitted has been agreed upon by the two committees for recommendation to their respective associations.

Members of the Association will note, in the form of agreement submitted, that no specific provisions relative to the bargain to be made between the railroad and the shipper as to division of expense, or ownership of track, have been incorporated in the proposed form of agreement. These are left open, for insertion at the option of each railroad, following the lines of the general policy which it may adopt relative to these matters.

A recommendation as to the general policy to be adopted by the railroads is appended to the agreement. The tendency at the present time is undoubtedly toward requiring the shipper to bear all the expense of the construction and maintenance of the industry track beyond the clearance line, while retaining in the railroad the ownership of that portion of the track located upon its right-of-way. This general policy has already been adopted in many parts of the country, while in others the railroad companies have not yet been able to entirely agree upon it. Its uniform adoption, however, in so far as practicable, is recommended for the whole country by members of the two committees acting as a joint committee.

Industry Track Agreement

This agreement, made this.... day of ..... in the year..... by and between..... party of the first part, hereinafter called the railroad company, and..... party of the second part, hereinafter called the shipper:

Witnesseth:

WHEREAS, The shipper desires industry track facilities, hereinafter called sidetrack, for the more economical and convenient conduct of its/his business, at or near..... Station, County of....., State of....., described as follows:

(Here describe length and exact location of track.)

in accordance with plans dated.....(Note—If desired insert "identified by the signature of.....") hereto attached and hereby made a part hereof; and

WHEREAS, The operation of cars and engines over said sidetrack at other than the regularly established station facilities of the railroad company involves the risk of damage to or destruction of property and injury to or death of persons;

Now, therefore, in consideration (Note—If necessary insert one ($1) dollar, etc.) of the above premises, the covenants and agreements herein contained to be kept and performed by the parties hereto, and of the payments hereinafter to be made, it is mutually agreed that the said sidetrack shall be constructed and maintained, and the railroad company hereby agrees to operate the same, under the following terms and conditions:

Right-of-Way

1. The shipper shall furnish at his/its own expense all necessary right-of-way outside of the right-of-way of the railroad company, required for the proper construction and operation of said sidetrack, said right-of-way to be satisfactory to the.....of the railroad company.

The cost and expense of procuring or complying with any ordinance, order, permit or consent whatsoever required by municipal, state or other lawfully constituted authorities for the construction, operation, maintenance and use of said sidetrack shall be borne by the shipper.

During the continuance of this agreement the railroad company shall have the right at all times to enter upon the property of the shipper, for the purpose of constructing, maintaining and operating said sidetrack.

Construction

2. The actual cost of constructing said sidetrack, including roadbed, trestles, bridges, and all other appurtenances in connection therewith, shall be borne as follows:

(Herein insert details covering terms and conditions as to furnishing labor and material and division of expense as agreed upon.)

(Note—If desired insert "The shipper shall also assume the expense of recording this agreement.")

Maintenance

3. Said sidetrack shall be maintained and renewed to the satisfaction of the..... of the

railroad company; the work shall be performed and the cost thereof borne as follows:

(Herein insert details.)

Ownership

4. The title and ownership of said sidetrack shall be vested as follows:

(Herein insert details.)

Use

5. The railroad company shall have the right to use, without cost, the whole or any part of said sidetrack for general railroad purposes, provided such use shall not unreasonably interfere with the use thereof by the shipper.

The shipper agrees that he/it will not permit or authorize the use of said sidetrack by or for the benefit of any other person, firm or corporation not one of the parties hereto, nor assign this contract or any rights thereunder, without the written consent of the railroad company.

Changes or Enlargement

6. If any change, rearrangement, extension or enlargement of said sidetrack or its structures shall at any time be required by reason of any change in the railroad company's track or tracks, or because of any changes in the operating practice of the railroad, or for any other cause, all expense resulting therefrom shall be borne by the shipper, unless otherwise mutually agreed by the parties hereto.

Clearances

7. The shipper shall not erect nor permit to be erected any building or structure, nor permit any material to be placed above top of rail within..... (.....) feet of the nearest rail of said sidetrack on straight track, or within..... (.....) feet on curve, nor permit anything to be placed above said sidetrack lower than a height of..... (.....) feet above the top of rail.

Accidents

8. The shipper agrees to exercise the greatest care in the use of said sidetrack to prevent cars or other obstructions from getting upon or too close to main or other tracks and generally to use such means and care as will avoid accidents of every kind.

Liability

9. The shipper hereby agrees to indemnify, protect, and save harmless the railroad company for loss of, damage to, or destruction of its/his property, or the property of any other person or persons upon the premises of the shipper by its/his request or consent, whether by fire or otherwise, or of death or injury to any person or persons (except where it can be shown that such death or injury to person or persons was due solely to negligence on the part of employees of the railroad company) arising out of the construction, maintenance, use or operation of said sidetrack.

Discontinuance

10. The shipper shall assume and bear any and all loss or damage sustained by him/it in consequence of any temporary or permanent elimination of said sidetrack, due to the relocation or change in the grade of the track or tracks of the railroad company by virtue of any municipal action or otherwise, or in event the disposition of the property of the railroad company or its future use or development shall make it impracticable in the judgment of the.....of the railroad company to continue the connection, and the shipper hereby waives any and all claims therefor.

Cancellation, Termination and Removal

11. It is expressly understood and agreed that if for the space of.....consecutive months said plant be not operated, unless prevented by a strike or strikes, or if the title to said plant become vested in or the operation thereof be transferred to some party other than the shipper, or if any other party operating said plant refuses to adopt this agreement and to agree in writing to be bound thereby, or if the shipper fails to keep and perform any of the covenants, agreements, terms, or condition, hereinbefore set forth to be by him/it kept and performed, then the railroad company reserves the right to terminate this agreement upon.....days' written notice to the shipper.

Upon termination of this agreement the railroad company shall have the right to enter upon the property of the shipper and take up and remove any or all the material owned by the railroad company as aforesaid, and shall not be liable to account in any way to anyone for any monies paid or expended on account of any of the track or tracks covered by this agreement, nor for any damages resulting from the removal of the track or tracks owned by the railroad company as aforesaid.

Until terminated as hereinbefore provided, this agreement shall inure to the benefit of and be binding upon the parties hereto, their heirs, executors, administrators, successors and assigns.

In witness whereof, the parties hereto have executed this agreement in.....the day and year first above written.

.....Railroad Company

By.....

Witness for Railroad Company

.....

(Shipper).....

By.....

Witness for Shipper

.....

Recommended Basis for Division of Cost of Construction and Maintenance, and Ownership of Industry Tracks

After leaving the right-of-way of the railroad company, all responsibilities of the company as a common carrier cease and in going beyond the right-of-way, the railroad company becomes the agent of the shipper in the operation of said sidetrack, thereby contributing to the economical operation and efficiency of its plant. This fundamental principle should, therefore, be considered in determining the basis for dividing the cost of construction and maintenance, and the ownership of such industry track.

An industrial sidetrack is essentially a plant facility and furnishes the shipper with service elsewhere than at the regular station of the railroad company. It is, therefore, recommended, as a matter of equity, in constructing such track, that the following terms as to division of expense and the ownership of property, should govern:

1. The railroad company may pay for and shall maintain that portion of the sidetrack from the switch point to the clearance point.

2. The shipper shall pay for and maintain that portion of the sidetrack beyond the clearance point, including roadbed, trestles, bridges and all other appurtenances.

3. That portion of the sidetrack upon the right-of-way of the railroad company shall be and remain the property of the railroad company.

4. That portion of the sidetrack beyond the right-of-way of the railroad company shall be and remain the property of the shipper.

Form of Agreement for Interlocking Plant

Your committee considered this form of agreement at three of its meetings, and also discussed it with a subcommittee of the Signal and Interlocking Committee of the Association. The Form of Agreement for Interlocking Plant herewith submitted is the result of action taken at these various meetings.

Members of the association will note that in the submitted form of agreement no attempt has been made to specify a basis upon which the expense for construction, maintenance and operation should be divided, because that portion of the agreement is part of the consideration which must be determined in each case by negotiation between the companies interested; and because conditions vary so widely in different parts of the country that no specific basis for apportioning the expense has been considered feasible. This portion of the agreement is therefore left open to be negotiated and written into the agrement in each case.

The articles covering Liability and Arbitration are incorporated in the submitted form, in order to complete the same. The committee recognizes the fact, as will doubtless also members of the Association, that these two articles are peculiarly the province of the legal officers of the railroads, and that they will therefore probably be modified in many cases, to meet local conditions, et cetera.

Agreement for Interlocking Plant

This agreement, made this ..... day of ....., 19.., by and between....., hereinafter called the..... company, and ....., hereinafter called the ..... company.

Witnesseth that:

WHEREAS (Note—Include brief description of conditions, including the location of existing or proposed grade crossing; an enumeration of all existing agreements, if any; the names of the companies between which agreements were made, their dates, purpose, et cetera).

WHEREAS, The parties hereto mutually desire to construct, maintain, renew and operate an interlocking plant at said crossing, the location of said crossing being shown, and the said interlocking plant to be arranged as shown on the blue print marked "Exhibit A," dated..... ....., identified by the signatures of the ..... of the.....company, and of the.....of the.....company, hereto attached, and hereby made a part of this agreement.

Now therefore, in consideration of the premises and of the mutual conditions and agreements hereinafter set forth, the parties hereto do covenant and agree as follows:

Definition

1. The term interlocking plant, herein contained, shall be held and taken to include any and all houses, towers, power plants, machinery, appliances and appurtenances required for the operation of the same.

Construction

2. The.....company agrees to construct an interlocking plant, as shown on said "Exhibit A," and in accordance with specifications which have been approved by the.....of the parties hereto, and identified by their signatures.

The cost of removing any existing safety appliances or devices shall be divided in like manner as the maintenance and renewal expense of said appliances or devices has heretofore been divided.

The.....company agrees to begin the construction of said interlocking plant within..... days after the execution of this agreement, and to carry the same forward to a prompt completion.

(Note—Insert penalty clause if desired.)

Apportionment of Cost

3. (a) The cost of constructing, maintaining and renewing said interlocking plant, as shown on said "Exhibit A," shall be borne by the parties hereto as follows:

Each party hereto shall participate in the ownership of said interlocking plant in the ratio which the payments made by it for construction of said interlocking plant, including extensions and changes chargeable to capital account, bear to the total cost of construction thereof.

The expense of maintaining and renewing said interlocking plant shall include taxes, assessments and insurance; all losses by fire, flood or other damage caused by the elements; also any change made necessary by an act, law or ordinance, of a lawfully constituted public authority.

(b) The cost of operating said interlocking plant, including power, heat, light, and supplies, shall be borne by the parties hereto as follows:

Spare Space

4. Spare levers, machine spaces, and building space, may be provided for its exclusive use upon request of either of the parties hereto, at the sole cost and expense of such party; provided, further, that the other party to this agreement may hereafter acquire the right to the exclusive use of the same by either paying the original cost, or by providing an equal amount of space of the kind used when the same shall be required, at the election of the party which originally provided the spare space.

Extensions and Changes

5. Either party shall have the right to make extensions or changes in said interlocking plant, provided that they shall not materially impair the efficiency of the same. All such extensions or changes, arising from changes made in any existing track or tracks, or made to cover any future track or tracks or connections, which either party hereto may have the right to construct, or which may be required by reason of any changes made in the standard appliances of either party, or which may be ordered by a lawfully constituted public authority, shall be made by the..... company, and the cost of such extensions or charges shall be borne by the party hereto for whose benefit said extensions or changes are made, and the amount chargeable to each party for maintenance, renewal and operation in such case shall be determined as follows:

Control of Plant

6. MAINTENANCE.—(a) The maintenance and renewal of said interlocking plant shall be under the sole charge and control of the.....company, and it shall employ competent persons to maintain and renew the same, and such parties from time to time so em-

ployed shall be removed for good and sufficient reason upon request in writing of a general managing officer of the.....company.

Each of the parties hereto, through its authorized employees and representatives, shall have the right at all times to inspect said interlocking plant, as well as the accounts covering the construction, maintenance, renewal and operation of the same; and in the event that the ..... company shall notify the ..... company in writing of renewals and repairs that may be necessary for the safe and proper operation of said interlocking plant, and if the ..... company neglects for a period of thirty days to make said necessary renewals and repairs, then the ..... company shall have the right to make such renewals and repairs, and the ..... company shall, upon presentation of proper bills, and within the time provided in Section Ten hereof, pay its proportion of the amount so expended.

(b) Each of the parties hereto shall, at its own expense, keep all switches and derails in its own tracks free from ice, snow, dirt or other obstructions which may interfere in any way with the proper working of said interlocking plant; and in case either party fails to do so, the other party may enter upon the premises of the party at fault and remove such ice, snow, dirt or other obstructions; in which event, the party at fault shall reimburse the party doing such work, as provided in Section Ten hereof, for all expense thereby incurred.

OPERATION.—(c) The operation of said interlocking plant shall be under the sole charge and control of the ..... company, and it shall employ competent persons to operate the same, and such persons from time to time so employed shall be removed for good and sufficient reasons upon request in writing of a general managing officer of the ..... company.

It is further mutually understood that either party may use the operators at said interlocking plant in its telegraph or telephone service, provided said party shall give the other party at least ten days' prior written notice of the same; but in the event that additional expense is so incurred, either on account of increased wages of operators over levermen, or on account of additional employees required, the party using the operators in its service shall bear the additional expense. If for any reason it becomes necessary to temporarily take the said interlocking plant out of service, the control of the flagmen required to protect said grade crossing shall also be in the ..... company, and the expense of said flagmen shall be considered, for the purpose of apportionment, as an expense of operating said interlocking plant.

Material and Labor Supplied by Parties

7. Each of the parties hereto shall, without cost to the other, furnish and install its own derails, switch points, switch rods, special switch and derail ties and timbers, all track insulations, poles, cross-arms, pins and insulators, and will maintain and renew them from time to time thereafter; likewise, without cost to the other party, do all the track work and grading along its own tracks necessary to prepare the same for the installation of said interlocking plant, and also provide and maintain proper drainage; likewise, bear the cost and expense of raising and adjusting pipe carrier and mechanism foundations, or the renewal of detector bars, clips or any other appliances required or made necessary by the resurfacing, reballasting or rail renewal of its tracks within the limits of said interlocking plant; likewise, furnish and install at its own expense any signal bridges, or other special signal supports, which may be required to support signals governing the movement of trains on its tracks.

Either party shall have the right to carry its automatic block signaling through the limits of the interlocking plant at its own expense. Where signals perform the function of both block and interlocking signals, the party hereto whose train movements are controlled by said block signals shall maintain the same at its expense.

Precedence

8. In the use of said interlocking plant passenger, mail and express trains shall have precedence over freight trains and light engines; and freight trains shall have precedence over light engines. The trains and engines of the ..... company shall have precedence over the trains and engines of like class of the ..... company.

Wage Rates

9. The wages of employees connected with maintenance, renewal and operation of said interlocking plant shall be the same as the standard wages paid by the ..... company for similar service to its other employees in the same territory.

Payment of Bills

10. All payments hereunder shall be made within thirty days after rendition of proper bills.

The ..... company shall render bills covering the cost of constructing said interlocking plant, such expense to be billed in one statement unless otherwise agreed upon by the parties hereto.

Bills covering the operation, maintenance and renewal of said interlocking plant shall be rendered monthly; and those covering insurance, taxes and assessments, annually.

Such of said bills as are based upon payroll cost of labor and stock prices of material shall include a fair arbitrary charge to cover supervision, inspection, handling, transportation, accounting and similar undistributed items of expense. Such fair arbitrary charge shall be in accordance with the recommendations of the General Managers' Association of ....., in effect from time to time, or in the absence of any such recommendations, shall be agreed to by the parties, or determined by arbitration as hereinafter provided.

Should dispute arise as to the correctness of any items included in bills rendered under this agreement, the party against which such bills are rendered shall pay all items concerning which there is no dispute, and the other items shall be paid promptly when the correctness thereof has been ascertained by arbitration or otherwise.

Liability

11. Each party hereto assumes for itself the responsibility and risk of using and operating its own trains and engines over the space covered by the said interlocking system, and also responsibility for the negligent acts and omissions or the alleged negligent acts or omissions of its own officers, agents, servants and employees engaged in connection therewith; and in performance of any of its separate duties under this contract; and will pay to the other party and to third persons all damages which may arise and for which it may be liable from such negligence and in such operation.

The party having special charge of the management and operation of said interlocking system shall not be liable to the other party for the negligent acts or omissions, or the alleged negligent acts or omissions of any person employed in the operation, maintenance or repair of said interlocking mechanism, but all persons so

employed shall, as respects any injury caused by such negligence, be regarded and treated as the agents or servants of each party hereto, and each of said parties hereby assumes the responsibility for all damages resulting from the negligence of such agents or servants in the operation of its own engines, cars and trains, and those of its tenants, lessees and licensees, at the said crossings, and shall indemnify and save the other party harmless therefrom. Any expense caused or growing out of the injury or any workman or employee engaged upon the construction of said interlocking plant shall be held and considered to be a construction expense, and shall be divided as herein in Section 3 provided.

Arbitration

12. In case of any differences or dispute arising under this agreement or concerning the subject-matter thereof, the parties hereto agree to submit such difference or dispute to three arbitrators, one of whom shall be appointed by the ..... company, and another by the ..... company, and each party shall give to the other party written notice of appointment of its arbitrator, together with his name and address. The two arbitrators so chosen shall select a third arbitrator. If either party shall fail to choose an arbitrator as herein provided, the arbitrator selected by the other party hereto, at the expiration of ..... days after the date of its said written notice, shall select a second arbitrator, and the two arbitrators so chosen shall select a third arbitrator. If within ..... days after the appointment of a second arbitrator, as herein provided, the two so chosen shall have failed to select a third arbitrator, either party hereto may apply to any judge of the District Court of the United States for the district which shall then include....., or ....., who shall thereupon appoint the third arbitrator. The three arbitrators so chosen in any manner as herein provided, or a majority of them, shall hear and decide said difference or dispute, and their decision, or that of a majority of them, shall be final and binding on the parties hereto.

The expense of an arbitration under the terms hereof shall be borne by the parties hereto in the proportions fixed by the arbitrators.

Cancellation of Conflicting Agreements

13. It is mutually understood and agreed that any and all agreements existing between the parties hereto or their predecessors, so far as they conflict, or are inconsistent with the terms and conditions of this agreement, are hereby annulled, but in all other respects they shall continue in full force and effect.

Duration and Succession

14. This agreement shall take effect on the..... days of ....., 19.., and shall continue in force during the existence and operation of the interlocking plant, or until discontinued by the mutual agreement of the parties hereto.

The provisions of this agreement shall be binding upon and inure to the benefit of the paries hereto, their successors, lessees and assigns.

In witness whereof, the parties hereto have caused this agreement to be executed in duplicate, by their respective officers, thereunto duly authorized, the day and year first above written.

....Company,
Secretary. By.....
.....Company,
Secretary. By.....

Committee: E. H. Lee (C. & W. I.), chairman; C. A. Wilson, vice-chairman; C. Frank Allen, S. D. Brady (Little Kanawha), O. P. Chamberlain (C. & I. W.), John P. Congdon, Thos. Earle, W. D. Faucette (S. A. L.), G. E. Gifford, J. C. Irwin (B. & A), R. G. Kenly (M. & St. L.), A. S. Kent (C. I. & L.), C. J. Parker (N. Y. C.).

Discussion

E. H. Lee (Chairman): The preliminary statement as to the scope of the committee's work for the association will not be read. We suggest no revisions for the Manual this year. Briefly stated, we prepared a form and submitted it to the association last year. For reasons internal to the committee itself, the form was not recommended for introduction into the Manual, and during the current year we found this same question of a uniform contract form of agreement for industry tracks was a subject before several other associations and railroad bodies, and it therefore seemed desirable to coordinate our efforts, so far as possible, with these other bodies, and after several joint meetings with representatives of the association which is principally interested in this particular agreement, we offered to this association this agreement for its approval and for introduction into the Manual.

I will just briefly run over Appendix A, and name the various headings, so if any objections are made or suggestions offered we can consider them.

(Mr. Lee then read the sub-divisions of Appendix A, and there was no discussion on them.)

(Mr. Lee then read Appendix B, "recommendations," and said):

I wish to call attention to the fact that nothing in the side-track agreement is intended to exclude or prevent any carrier from inserting: (1) any routing clause, (2) any clause for the continued use of the right of way to other established industries beyond, or being served through, said track (under clause No. 5) by payment of a per cent on fair valuation of land used; mutually valued or arbitrated if not agreed upon.

I move the adoption of the agreement for industry track and its incorporation in the Manual. (Approved.)

Mr. Lee then read the matter headed, "Report on form of Agreement of Interlocking Plant," and then read the headings in the agreement in Appendix C.

The President: Is there anything in this contract as to what company shall operate the plant?

Mr. Lee: That is left to negotiation between the parties.

H. R. Safford (G. T.): As I read the agreement, it is predicated on a situation where two parties are jointly involved, and where the relation of the two is not that of junior on one side and senior on the other, and I have no criticism to offer to the agreement as to that feature, but this agreement would not apply and would not protect the senior company in the case of a crossing where one company was responsible for all of the expenditures. In that case the junior company should take at least all of the liabilities in connection with the operation and maintenance of that crossing. Has the committee given any consideration to the fact that there must be a change in the form of the contract to cover that condition?

Mr. Lee: The committee considered that phase of the subject thoroughly, as one or more members of the committee had identical conditions in the territory served.

I wish to move the adoption of the uniform contract form for interlocking plants and its incorporation in the Manual.

(The motion was duly put and carried, and the committee dismissed with the thanks of the association.)

WINDY CITY ECHO

(COUNT THE LETTERS)

13TH ENGINEERS, (RY) U. S.

Vol. 1. No 1. | FEBRUARY 13, 1918 | PRICE 2½ Washers

THE COLONEL'S MESSAGE

The members of this regiment, having grown accustomed to the more or less novel conditions which surround the work upon which they are engaged and to the equally novel if not always comfortable conditions under which they must live, it is natural that they should turn their attention to devising ways and means of recreation and amusement to while away the hours when not on duty. It is in that spirit and largely with that object in mind that the Windy City Echo makes its first appearance. Unlike commercial newspapers it does not aspire to a large number of subscribers and advertisers but to a large number of contributors and its success or failure will be measured in part by the extent to which this aim is realized.

It is in no sense an official organ. On the contrary it is the work of the soldiers of the Regiment acting through representatives chosen from each company and only such restrictions will surround its publication as are required by the censorship regulations and for the maintenance of military discipline.

The Echo has before it a great field of usefulness. Besides its success as an entertainer and as a medium for the exchange of ideas, which seems to be assured, it can do much to stimulate Regimental Esprit and to initiate and foster various other forms of recreation and amusement.

That it will seize these opportunities and thus become a powerful instrument for good in shaping the destiny of the Regiment is the earnest wish of the Regimental Commander.

C. W. KUTZ.

OBITUARY

Prudent R. Van Rissinghem, Company B, was fatally injured by being thrown from his train at S------ on December 27th, 1917. He was born in Nevele, Belgium, and enlisted from East Moline, Illinois, where he was employed on the Chicago, Rock Island & Pacific Railroad. He was a good soldier and a good friend, and the first man of the regiment to lose his life on active service. He was buried with military honors at F----- the day following his death. The services were conducted jointly by Lt. Cutler, Chaplain, and a French priest from the hospital.

Jesse C. Main, Company D, died at American Base Hospital No. 15 on December 16th, 1917, from a complication of diseases resulting from typhoid and pneumonia. He was removed to the Base very shortly after being taken sick, and during his five weeks there was in daily communication with friends from this regiment convalescing there. He was 27 years old and enlisted from Stillman Valley, Ill. and had worked for the Chicago, Milwaukee & St. Paul Railroad. He was buried at the Base, and a dozen men from the regiment, were able to attend the funeral service. He was a very cheerful, willing worker and was widely known in the regiment.

BUCK UP

Buck up boy, it ain't so bad
Dog-gone, it might be worse,
A soldier's alive until he's dead
So why climb into the hearse.

Of course you're takin' a gambler's chance,
But it's a hundred to one you'll win,
So just buck up it ain't so bad,
Accept it all with a grin.

You wanta go back? Well so do I
And it's that that'll make you fight,
But you can't give in to the inner man
And expect to do things right.

Why cuss it kid, think of the guy
Who ain't seen home in years,
If you've gotta feel bad, feel bad for him,
He hasn't got time for tears.

So forget about the lonely streak,
Remember the part you play,
You're over here to do your bit
And until then you've gotta stay.

You're thinkin' about the folks back home?
Well they're thinkin' about you too,
They're mighty proud you're over here
So why the devil feel blue?

So just buck up, do your share,
And doin' it wear a smile,
It's the things we here to fight hard for
That makes our lives worth while.

Why it's all a part of Lifes big game,
Loneliness, love and joy,
But it's things like that, that make the man,
Be a man, Buck Up, my boy!

TED SULLIVAN
Med. Dept.

APPRECIATION

The 13th wishes to thank each and every one of the friends back home who were instrumental in making our Christmas more enjoyable by sending over here Christmas boxes and various other forms of presents :

A large proportion of the Christmas boxes received by the men were grouped in Chicago and shipped in large boxes, which secured very prompt handling and insured their arrival with minimum of loss and breakage. Every man in the regiment appreciated the amount of trouble it was to do all the work in connection with notifying their relatives and getting the packages together. On behalf of the men we take this opportunity of expressing their hearty thanks to Mrs. W C. Langfitt, Mrs. R. D. Black, Mrs. N. L. Howard, Mrs. C. A. Holmes, Mrs. E. E. Stoup, Mrs. E. H. Shaughnessy, and Mrs. V. H. Hagelbarger.

In addition to this the employes of the following railroads, which are represented by a company in this regiment, are tendered the grateful acknowledgment for work they have done for the men :

Illinois Central
Chicago, Rock Island & Pacific
Chicago Great Western
Chicago, Milwaukee and St. Paul
Chicago & Northwestern
Atchison, Topeka & Santa Fe.

Another of our benefactors was Vice President E. A. Howard of the Chicago Burlington & Quincy Railroad, who provided cigars for every man in the regiment.

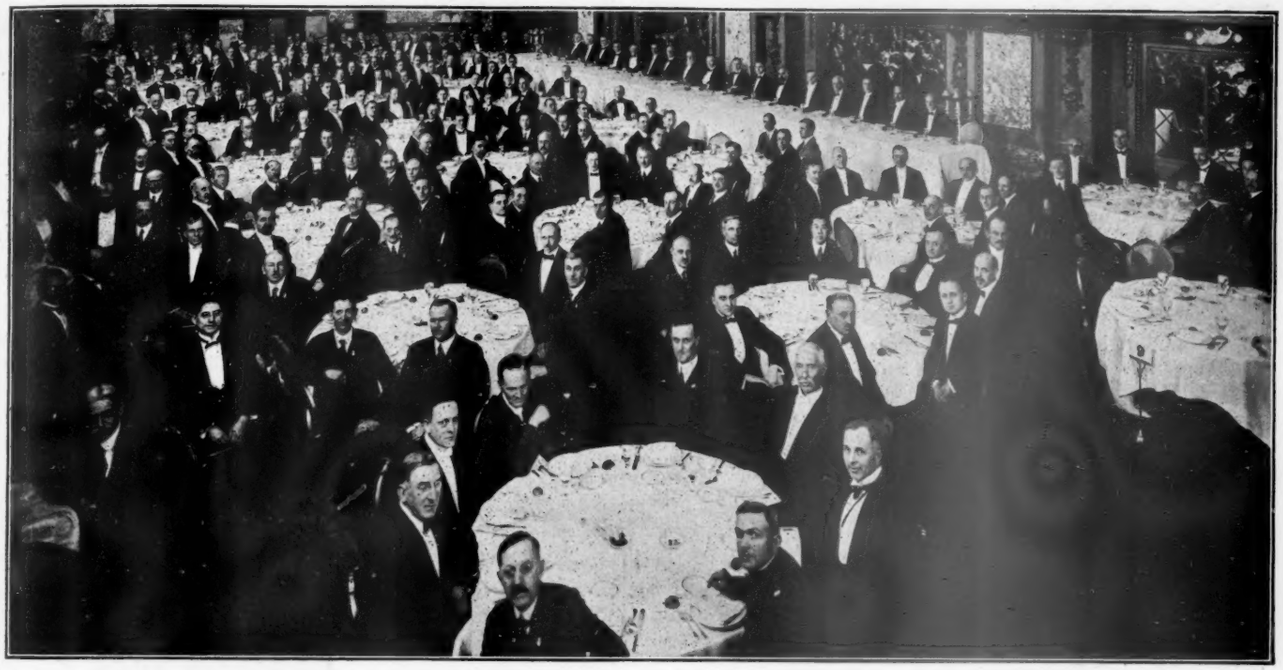
In spite of the fact that the men from the Chicago, Burlington & Quincy are scattered amoung different regiments, the employes of that railroad got together a fund of more than $500.00 which will go far toward providing the little extras which help se much in padding up the regular ration allowance.

Officer of the day : « I saw you lying in the gutter last night. »
Joe Burnes : « Yes sir, two Master Engineers were holding me down. »
O. of D. : « Who were they? »
J.B. : « Haig and Haig. »

°°°

Have you noticed that all the French girls have the Arc de Triomphe in their eye?

A copy of the first paper published by the 13th Engineers (Railway) regiment, which is now operating railways "somewhere in France." Among the officers of this regiment are a number of members of the American Railway Engineering Association, including Charles L. Whiting, major, Second Battalion (formerly division superintendent, C. M. & St. P.); W. G. Arn, captain adjutant (formerly assistant engineer, maintenance of way, I. C.); C. E. Carson, captain adjutant (formerly superintendent, F. D. D. M. & S.); and T. W. Fatherson, captain engineer (formerly engineer maintenance of way, C. G. W.)



Banquet of American Railway Engineering Association

Annual Dinner of the Engineering Association

Abstracts of Addresses at the "War-Fare" Dinner Held in the Gold Room of the Congress Hotel Last Evening

THE NINETEENTH ANNUAL DINNER of the American Railway Engineering Association was held in the Gold Room of the Congress Hotel last evening with President John G. Sullivan presiding as toastmaster. The speakers included Sir Edmund Walker, president of the Canadian Bank of Commerce, who spoke on "Canada's Part in the War"; Edward R. Kelsey, governor of the International Association of Rotary Clubs, whose topic was "Good Fellowship," and Rev. Stephen K. Mahon, the title of whose address was "Unsolved Problems."

The program was highly patriotic in character. All of the speakers laid emphasis on the necessity of taking all possible measures to back up our troops at the front.

Two tables were occupied by Santa Fe men, while the Rock Island men filled three tables. The Cornell University alumni also occupied a table as in previous years.

Canada's Part in the War

Sir Edmund Walker spoke in part as follows:

In speaking to an audience consisting, as this gathering does, of men who deal with facts scientifically the message must be free of camouflage and boasting while retaining the courage to give praise where due. Canada is much misunderstood by Americans, but it is to Americans like George Louis Beer and Clarence W. Alvord that the British owe their knowledge of the colonial system of Great Britain.

The early Canadians were French, clinging to their own systems, United Empire loyalists determined to build on Great Britain's mistakes, the Scotch and the Irish who love fighting and the English who would not readily lose touch with the old land. These are the people who won successive victories in parliamentary struggles and brought to the British dominions beyond the seas autonomy so complete that only a silken thread is left.

How would such a people act when Great Britain was in trouble? Tribal feeling is the strongest instinct in man. So we did not hesitate. Great Britain had pledged her honor for Belgium and by the end of July, 1914, men from all parts of Canada were either offering military regiments or volunteering to raise them. Step by step there were raised about 400,000 men and then we resorted to conscription to carry out our pledge of 500,000 men. To make this army effective we soon realized that we alone must clothe, feed and arm our men.

The manufactures in Canada are not highly developed. Our problem was to secure machinery, plan factories and train men and eventually women. The Munitions Board had to guarantee deliveries of raw materials, build factories and increase the output generally. The articles grew from shrapnel shells to aeroplanes and ships. Now Canada is producing these articles in 550 factories. On these plants the sum of $13,500,000 has been expended for the account of the Imperial Government. The Board has contracted for a large number of high power aeroplane engines and there are now under contract in Canada 112 steel and wooden ships with 405,600 tons capacity, aggregating in value over $90,000,000. The cost of the war to Canada at the end of 1917 had totaled $760,000,000. In our last loan we asked for $150,000,000 from our people. We received subscriptions for $417,000,000.

We in Canada are not war weary. It is burned into us that if the war is lost it will be by the civilian people at home. Our civilian soldiers made in a few months have amazed us. I shall not try to follow them from the

first fight at St. Eloi through the battle of Ypres and many other fights which will be associated with the name of Canada forever.

Between 20,000 and 30,000 English women are now in France serving as nurses and searchers, etc. Canadian women are serving everywhere. In Canada they are the bulwark of every charity and are filling men's places in every walk of life.

Despite submarines the number of vessels coming and going in all United Kingdom ports was greater in December, 1917, than in February, 1917, when submarine war really began. The British Navy alone has made this possible. Great Britain has carried safely across the sea 13,000,000 soldiers and has only lost 9 transports and 9,000 men. She has also convoyed safely 2,000,000 horses, 25,000,000 tons of war supplies and 53,000,000 tons of coal and oil.

With the entry of the United States into the War our boys are fighting together. If we can but make democracy workable, we can together make the world worth while, which it certainly is not just now.

Dr. Mahon's Address

Dr. Mahon spoke in part as follows:

Unsolved Problems, we have had them. We have always had them. Some have been easy to solve. Some have caused the midnight oil to burn. Solution has come when there was a willingness to accept the facts no matter how unpleasant, and to deal honestly, vigorously, and persistently with them. The Pilgrims solved the Indian problem with shotguns, and it was not General Sherman, but General Miles Standish, who first said, "The only good Indians are the dead ones."

The American ideal is essentially an ideal of democracy. In the three great tidal waves of immigration, the first was for religious liberty; the second for political liberty, and the third for economic liberty. America, with all her mistakes, has kept clearly in the conscience of her body politic those ideals of justice, liberty, equality and righteousness which are dearer than life itself. She has always desired peace. Her wars have always been wars in which principles were involved. If sometimes the nation has seen "through a glass darkly" the progress has nevertheless been up and not down. The policy has been that of good will, generosity and co-operation. The standard nationally has been "of the people, by the people and for the people," and not "of the people, by the rascals, for the rich."

Over against the American ideal of democracy with its reverence for law and reverence for the rights of others is the Roman ideal, modernized as we see it today in Germany where the big word is that of "Verboten"—forbidden. It is found everywhere throughout the nation; it is the rule of fear. The leaders of Germany are out for a modern Roman Empire; they believe in it. They have prepared for it; at all stages they have been game for the colossal risks involved. The object is power; the state has no morals. Like the monster in Mrs. Shelley's "Frankenstein," there is the body, the brute, the mind with its cunning, but it has no soul, no sense of justice, no sense of obligation—a monster who victimizes.

It is said that when the German army entered Louvain, the priests and preachers prayed, the nuns wept, the young girls besought brutal men for mercy; but all to no avail. You cannot argue with a drunken man, nor preach to a lion, or persuade a brigand. America, standing in the presence of treaties violated, all the finer instincts of our civilization desecrated, its liberties denied —what must she ask herself? What have I to gain by war? What would I lose? Would it be the popular move, the expedient thing? Would it be profitable?

Lincoln said, "A house divided against itself cannot stand; we cannot exist half-slave and half-free." We accepted that doctrine for our nation, a war was waged, and justice was established. Now we say, we cannot exist half-autocracy and half-democracy, and in using these terms I mean them in no platitudinous way. But interpreted by our text we cannot exist with one half seeking to have Lordship over the faith of the people while the other half is seeking to be helpers of their joys.

Which shall conquer? Germany says, "We shall win"; Bernstorff says, "America is too far away"; Von Hindenburg says, "America has come in too late." No one knows what a night will bring forth, changing the destinies of centuries. In such a situation, we must do more than simply stand and wait.

The Great Adventure

Study the great characters of history. Where did they come from? The Joan of Arc, the Washingtons, the Lincolns, the Lafayettes—they are those who, in response to the common experiences of their day, gave themselves to the bettering of those conditions. This is the challenge of today—injustice, hate, greed, ambition, autocracy trampling the rights of humanity under foot; there leaps up in the soul resentment, we see red, we feel a passion to correct wrong; we must respond to the challenge or the soul shrivels. When some of the white stars of our service flags are being splashed with red and some being turned to gold, there is no place for the profiteer and the greedy. Each must sacrifice. Every man is in the war. It is the glory of America that she answers the call of the oppressed.

Christianity is the single solid hope of world peace—so far from Christianity having failed, this is a war for Christian principles. The rule of Christ only can usher in the rule of peace. Therefore, we must not only win the war, we must win the world. The great issue in the world today is the Kingdom of God. Underlying the material are the ultimate spiritual issues. Col. House, on his return from Europe, said to President Wilson, "There can be no permanent peace until the churches christianize international relationships."

Good Fellowship

The last speaker was Edward R. Kelsey, governor of the International Association of Rotary Clubs. He outlined some of the things to be gained by "good fellowship" in an organization such as the American Railway Engineering Association. He expressed, by example, what real friendship means. However, to secure the maximum good a man must do his part, the "I-don't-like-that-man" spirit will not do. How much sunshine have you spread in his path? Optimism is another attribute now so essential. Acquire the "I-can-do-it" habit. The success of the Liberty Loan campaigns illustrate what can be done, and what must be done again with the help of these characteristics.

Meeting of Committee V—R. S. A.

Committee V of the Railway Signal Association on Maintenance and Operation, L. R. Mann, chairman, held a meeting yesterday in Room 344 at the Auditorium Hotel. Rules were drafted for the instruction of mechanical men and maintainers for use at mechanical interlocking plants. These are to be printed in card form for placing in towers. Similar rules are also to be formulated for electro-mechanical electric and electro-pneumatic plants.

A. R. E. A. Election of Officers

An announcement of the results of the balloting for officers for the ensuing year was made at the close of yesterday's session. The officers are as follows:

President, C. A. Morse, chief engineer, Chicago, Rock Island & Pacific, Chicago.

First Vice-President, Earl Stimson, engineer maintenance of way, Baltimore & Ohio, Baltimore, Md.

Second Vice-President, H. R. Safford, chief engineer, Grand Trunk Railway System, Montreal, Canada.

Secretary, E. H. Fritch.

Treasurer, George H. Bremner, district engineer Bureau of Valuation, Interstate Commerce Commission, Chicago.

Directors, J. L. Campbell, engineer maintenance of way, El Paso & Southwestern, El Paso, Texas; E. A. Frink, principal assistant engineer, Seaboard Air Line, Norfolk, Va., and E. H. Lee, vice-president and chief engineer, Chicago & Western Indiana, Chicago.

Nominating Committee, J. E. Crawford, chief engineer, Norfolk & Western, Roanoke, Va.; H. T. Douglas, Jr., chief engineer, Chicago & Alton, Chicago; J. V. Hanna, chief engineer, Kansas City Terminal Railway, Kansas City, Mo.; J. B. Jenkins, formerly valuation engineer, Baltimore & Ohio, now in military service; J. E. Willoughby, chief engineer, Atlantic Coast Line, Wilmington, N. C.

Earl Stimson,
First Vice-President Elect

C. A. Morse,
President Elect

H. R. Safford,
Second Vice-President Elect

President Charles A. Morse

Charles Adelbert Morse, whose election as president of the American Railway Engineering Association was announced yesterday, is an enthusiastic believer in the value of engineering organizations. Although he came to Chicago only four years ago and is carrying the responsibilities of the position of chief engineer of the Rock Island Lines, a system of over 8,000 miles, he has found time to take active part in the work of a number of important engineering organizations and has made his influence felt strongly in them. In addition to assuming the presidency of the American Railway Engineering Association today, his election as president to the Chicago Engineers' Club will be announced tomorrow, although as first vice-president of this organization he has been performing the duties of the president for the last eight months owing to the absence of the regularly-elected president in Russia. He is chairman of a sub-committee on water waste of the Chicago Association of Commerce. He is also a member of a special committee on public affairs of the Western Society of Engineers, Chicago, and is the member of the nominating committee of the American Society of Civil Engineers from the eighth district. He is equally active in the work of the American Railway Association, being chairman of the sub-committee on engineering, which has been considering clearance legislation among other problems and being a member of the maintenance committee of that same organization.

Mr. Morse is an enthusiast in any work which he undertakes, in his railway work as well as in his association activities, his success can be contributed largely to the enthusiasm which he instills in those with whom he comes in contact. With this enthusiasm is combined an aggressiveness and a disregard for restrictive precedents which enable him to cut any obstructive red tape to secure the desired results. Under his leadership the American Railway Engineering Association should make important progress during the next year, a period in which many problems will be presented, the proper solution of which is essential to the continued welfare of the organization.

Charles A. Morse was born at Bangor, Me., on January 1, 1859, and was educated at the University of Maine. After completing his education, he immediately came west and began railway work as a chainman with the Chicago, Burlington & Quincy. After spending four years with that company he became division engineer on the Mexican Central, where he remained for a year and a half before returning to the Burlington. He entered the service of the Atchison, Topeka & Santa Fe as a transitman in January, 1886, and remained continuously in the employ of that road for almost 27 years, during which time he passed through all the grades to that of

chief engineer of the system. He was division engineer and resident engineer at Fort Madison, Iowa and Pueblo, Colo., until July, 1901, after which he was assistant to the chief engineer at Topeka for seven months and then principal assistant engineer at La Junta, Colo., for 13 months. From March 1, 1903, to July 1, he was engineer of the eastern grand division at Topeka, after which he was acting chief engineer of the Atchison, Topeka & Santa Fe until July 8, 1904, on which date he was appointed assistant chief engineer. On September 1, 1905, he was appointed chief engineer of the Coast Lines, with headquarters at Los Angeles, Cal., and one year later he was appointed chief engineer of the lines east of Albuquerque, N. M., with headquarters at Topeka, Kan. In November, 1909, he was appointed chief engineer of the Santa Fe System, which position he held until March, 1913, when he became chief engineer of the Chicago, Rock Island & Pacific at Chicago.

A. R. E. A. Registration

Auryansen, F., Bridge Eng., L. I. R. R., Jamaica, N. Y.
Baldwin, Hadley, Asst. Ch. Eng., C. C. C. & St. L. Ry., Cincinnati, O.
Barnhart, E. H., Asst. Eng., B. & O. R. R., Baltimore, Md.
Beall, L. L., Ch. Eng., A. B. & A. R. R., Atlanta, Ga.
Bell, Gilbert J., Eng., West. Dist., A. T. & S. F. Ry., Newton, Kan.
Bergen, W. J., Asst. to Ch. Eng., N. Y. C. & St. L. Ry., Cleveland, O.
Berry, J. B., Cons. Eng., Chicago, Ill.
Blaess, A. F., Eng. M. W., I. C. R. R., Chicago, Ill.
Bouton, W. S., Eng. B. and B., B. & O. R. R., Baltimore, Md.
Boyd, G. E., Div. Eng., D. L. & W. R. R., Buffalo, N. Y.
Boykin, R. H., Div. Eng., Erie R. R., Susquehanna, Pa.
Brown, H. W., Asst. Div. Eng., Pa. Lines, Cleveland, O.
Butterworth, A. S., Asst. Eng., M. P. R. R., St. Louis, Mo.
Cadarette, Nelson, Asst. Eng., D. S. S. & A. Ry., Duluth, Minn.
Cassil, H. A., Eng. M. of W., P. M. R. R., Detroit, Mich.
Chandler, Charles, Asst. Bridge Eng., I. C. R. R., Chicago, Ill.
Charles, R. S., Layne-Bowler Co., Memphis, Tenn.
Coburn, Maurice, Prin. Asst. Eng., Pa. Lines West, St. Louis, Mo.
Cook, R. A. (in Military Service).
Cronican, W. P., Asst. Eng., I. C. R. R., Chicago, Ill.
Crugar, E. L., Dist. Eng., I. C. R. R., New Orleans, La.
Cunningham, A. O., Ch. Eng., Wabash Ry., St. Louis, Mo.
Dakin, A. H., Jr., Cons. Eng., 370 St. Nicholas Ave., New York.
Davis, C. S., St. Eng., Detroit & Pa. R. R., Detroit, Mich.
DeMore, G. A., Div. Eng., N. Y. N. H. & H. R. R., Hartford, Conn.
Dennis, Walt, Prin. Asst. Eng., Wabash R. R., St. Louis, Mo.
Donahey, J. A., Gen. Supt. and Ch. Eng., A. C. & Y. Ry., Akron, Ohio.
Doupe, J. L., Ch. Sur., C. P. R., Winnipeg, Canada.
Dyke, R. L., Div. Eng., N. Y. S. & W. R. R., Elmira, N. Y.
Evans, John, Div. Eng., M. C. R. R., Detroit, Mich.
Faulkner, L. E., Ch. Eng., Miss. Cent. Ry., Hattiesburg, Miss.
Finley, W. H., Ch. Eng., C. & N. W. Ry., Chicago, Ill.
Fisher, S. B., Care M. K. & T. Ry., Parsons, Kan.
Ford, R. H., Eng., Tr. Elev., C. R. I. & P. Ry., Chicago, Ill.
Gebert, S. C., Val. Dept., C. H. & D. Ry., Cincinnati, O.
Glass, J. J., Ch. Draftsman, C. G. W. R. R., Chicago, Ill.
Grant, E. W., Asst. Eng. Val., Santa Fe Ry., Topeka, Kan.
Hawthorne, F. M., Asst. Div. Eng., Pa. Lines, Louisville, Ky.
Heritage, C. S., Bridge Eng., K. C. S. Ry., Kansas City, Mo.
Hill, G. D., Asst. Eng., Val. Dept., N. Y. C. R. R., Cleveland, O.
Howard, R. H., Ch. Eng. M. W., Wabash Ry., St. Louis, Mo.
Hoyt, C. B., Supt. Tr. Maint. and Const., N. Y. C. & St. L. R. R., Cleveland, O.
Johnson, E. A., Supt. B. & B., Maine Cent. R. R., Bangor, Me.
Johnson, Noah, Eng. M. of W., Wabash R. R., Peru, Ind.
Johnston, D. B., Div. Eng., Pa. Lines, Louisville, Ky.
Johnston, T. S., Care L. E. Myers Co., Chicago, Ill.
Katte, E. B., Ch. Eng. Elec. Trac., N. Y. C. R. R., New York.
Kegler, W. C., Eng. M. W., C. C. C. & St L. Ry., Galion, O.
Khuen, Richard, Gen. Man. Erect., Am. Bridge Co., Pittsburgh, Pa.
Knight, H., Supt. M. W., Erie R. R., New York City.
Larsson, C. G. E., Asst. Ch. Eng., Am. Bridge Co., New York.
Latham, R. L., Ch. Eng., H. & B. Ry., Hamilton, Ont., Canada.
Lloyd, H. A., Spl. Agt., Erie R. R., Jersey City, N. J.
Maischaider, A. F., Eng. M. of W., Big Four Ry., Mattoon, Ill.
Martin, E. L., Eng. M. W., M. K. & T. Ry., Dallas, Tex.
McComb, R. J., Supt. Tracks, W. & L. E. R. R., Brewster, O.
Miesse, C. H., Jamestown, N. Y.
Mills, A. L., Receiver, Ft. S. & W. R. R., Ft. Smith, Ark.
Montfort, R., Cons. Eng., L. & N. R. R., Louisville, Ky.
Neubert, John V., Eng. Track, N. Y. C. R. R., New York.
Newhouse, C. E., Asst. Div. Eng., B. & O. S. W. R. R., Seymour, Ind.
Passel, H. S., Ch. Eng., C. I. & W. R. R., Indianapolis, Ind.
Pearce, R. M., Res. Eng., P. & L. E. R. R., Pittsburgh, Pa.
Petersen, W. H., Eng. M. W., C. R. I. & P. Ry., Des Moines, Ia.
Pfafflin, E. H., Ch. Eng., C. T. H. & S. E. Ry., Chicago, Ill.
Puder, F. R., Asst. Eng., C. T. H. & S. E. Ry., Chicago, Ill.
Purdon, C. D., Ch. Eng., St. L. S. W. Ry., St. Louis, Mo.
Ramage, J. C., Supt. of Tests, Sou. Ry., Alexandria, Va.
Ray, W. M., Asst. Eng., B. & O. R. R., Cleveland, O.
Reichmann, Albert, Div. Eng., Am. Bridge Co., Chicago, Ill.
Rettinghouse, Herman, Ch. Eng., C. St. P. M. & O. Ry., St. Paul, Minn.
Rhodes, E. M., Asst. Eng., B. & O. R. R., Baltimore, Md.
Ringer, Frank, Ch. Eng., M. K. & T. Ry., Dallas, Tex.
Robinson, J. S., Div. Eng., C. & N. W. Ry., Chicago, Ill.
Rossiter, L. P., Div. Eng., L. V. R. R., Buffalo, N. Y.
Rys, C. F. W., Met. Eng., Car. St. Co., Pittsburgh, Pa.
Safford, H. R. (Director), Ch. Eng., Grand Trunk Ry. Sys., Montreal, Canada.
Schulz, W. F., Ch. Eng., Subway Const., Memphis, Tenn.
Scott, Guy, Div. Eng., Pa. Lines, Fort Wayne, Ind.
Sexton, J. R., Div. Eng., Erie R. R., Huntington, Ind.
Shaw, B. B., Div. Engr., C. R. I. & P. Ry., Haileyville, Okla,
Smith, F. A., Civil Eng., Chicago, Ill.
Smith, Lowry, Special Eng., Nor. Pac. Ry., Brainerd, Minn.
Spell, W. A., Asst. Eng., A. B. & A. Ry., Atlanta, Ga.
Swisher, H. H., Asst. Eng., C. M. & St. P. Ry., Chicago, Ill.
Taylor, C. M., Supt. Creos. Plant, P. & R. Ry., C. R. R. of N. J., Port Reading, N. J.
Taylor, E. B., Jr., Div. Eng., Pa. Lines, Pittsburgh, Pa.
Tebbetts, G. E., Br. Eng., Kansas City Term. Ry., Kansas City, Mo.
Teesdale, C. H., Forest Products Lab., Madison, Wis.
Tordella, J., Div. Eng., B. & O. R. R., Garrett, Ind.
Tuthill, G. C., Acting Br. Eng., M. C. R. R., Detroit, Mich.
Tuthill, Job, Ch. Eng., P. M. R. R., Detroit, Mich.
Unger, J. S., Man. Research Lab., Carnegie Steel Co., Duquesne, Pa.
Walker, W. K. (in Military Service).
Walling, V. R., Prin. Asst. Eng., C. & W. I. R. R., Chicago, Ill.
Warden, R. E., Asst. Eng., M. P. R. R., Little Rock, Ark.
Welty, H. T., Eng. of Struct., N. Y. C. R. R., New York, N. Y.
Westfall, C. C., Eng. Bridges, I. C. R. R., Chicago, Ill.
Wilkinson, J. W., Div. Eng., N. Y. C. & St. L. R. R., Cleveland, Ohio.
Williams, K. G., Res. Eng., Union Ry. Co., Memphis, Tenn.
Wilson, C. A., Cons. Eng., Cincinnati, O.
Wurzer, E. C., Div. Eng., M. C. R. R., Detroit, Mich.
Yates, J. J., Bridge Eng., C. R. R. of N. J., New York, N. Y.

Guests

Adams, Lem, Cont. Eng., O. S. L., Pocatello, Idaho.
Armstrong, Wm., H., Mgr. Tie Tamper Dept., Ingersoll-Rand Co., New York.
Black, E. S., Chicago, Ill.
Balkwill, S., Pres. Balkwill Manganese Crossing Co., Cleveland, Ohio.
Bockemole, C. L. A., Bldg. Insp., Santa Fe R. R., Chicago, Ill.
Boyd, Jas. K., Wilkensburg, Pa.
Brown, W. E., Div. Eng., C. R. I. & P. R. R., Goodland, Kan.
Challoner, Thos., N. P. Ry., Jamestown.
Cowrie, Fred C., Montreal Harbor Commission, Montreal, Can.
Coyne, C. S., Asst. Eng., Grand Trunk R. R., London, Canada.
Davice, T. H., Asst. Eng., Indianapolis Trac. & Term. Co., Indianapolis, Ind.
Dey, V. A., Asst. Eng., Can. Pac. Ry., Montreal, Canada.
Dorland, A. G., Asst. Eng., E. J. & E. Ry., Joliet, Ill.
Dougan, H. K., Office Eng., Val. Dic., S. N. R. R., St. Paul, Minn.
Du Vall, R. N., Eng., Erie R. R., New York City.
Earhart, C. E., Sig. Eng., Vicksburg Route, Vicksburg, Miss.
Fuller, Frank, Roadmaster, N. P. R. R., Dilworth, Minn.
Ford, M. H., Eng. Dept., Rock Island Lines, Chicago, Ill.
Freeman, J. E., Eng. Technical Div., Portland Cement Association, Chicago, Ill.
Greenland, W. W., Eng. M. of W., Wabash R. R., Moberly, Mo.
Galvin, P., Gen. Roadmaster, Osawatomie, Kan.

Haywood, A. E., Drafts., Grand Trunk R. R., Battle Creek, Mich.
Hawkins, E. H., Asst. Eng., Mo. Pac., Atchison, Kan.
Heels, P. M., Track Supervisor, Grand Trunk R. R., Hamilton, Ont., Canada.
King, Coleman, Track Supervisor, L. I. Ry., Jamaica, N. Y.
King, Thos., Supt. Grand Trunk R. R., Detroit, Mich.
Lewessbury, B. R., Cleveland Tractor Co., Cleveland, O.
Lichter, C. A., Gen. Insp., C. & Nev., Chicago, Ill.
Lloyd, M. G., Elec. Eng., Bureau of Stds., Washington, D. C.
Luehan, C., Roadmaster, C. R. I. & P. Ry., Cedar Rapids, Ia.
Paul, Lesley C., West. Ed. Elec. Ry., Inc., Chicago, Ill.
Pendleton, D. E., Asst. Eng., C. & W. I. R. R.
Priest, H. M., Design Eng., C. R. I. & P. R. R., Chicago, Ill.
Rhodes, W., Eng., Maint., A. & S. and V. A. & P. R. R., Vicksburg, Miss.
Rissoner, R. B., Div. Eng., Union Pacific, Pocatello, Idaho.
Robbins, O. B., 914 Karpen Bldg., Chicago, Ill.
Robinson, R. T., Res. Eng., Mich. Cent. R. R., Detroit, Mich.
Robinson, C. S., Asst. Eng., Maine Cent. R. R., Portland, Me.
Sackett, H. S., Timber Eng., C. M. & St. P. R. R., Chicago, Ill.
Salisbury, E. F., Mo. Pac. R. R., Falls City, Neb.
Selliman, J. M., Res. Eng., London, Ont., Canada.
Shiraiski, T., Civil Eng., Tokyo, Japan.
Smith, Jos., Roadmaster, N. P. Ry., Brainerd, Minn.
Spicer, V. K., Union Switch & Signal Co., Chicago, Ill.
Stokes, G. A., Supt., Port Huron Terminals, G. T. R. R., Port Huron, Mich.
Tremaine, H. M., Mo. Pac. R. R., St. Paul, Minn.
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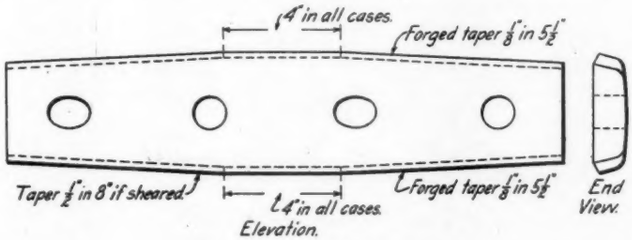
An Improved Design of the Roach Rail Joint

MOST OF THE RAIL joints now in use are designed on the principle of connecting the rail ends by members intended to continue the stiffness of the rail across the joints. A rail joint must also act as an expansion joint for the rail, and provide for the necessary slipping of one or both rails within the clasp of the joint members as the rails change in length, with variations in temperature. Because of these two conflicting requirements, the primary office of the rail joint—to make the separate rails act as continuous members by the joints—

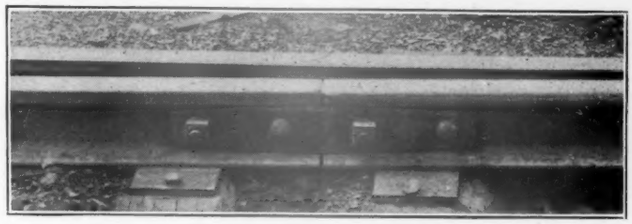


Details of a Joint Bar

has been difficult to accomplish. This is one reason why a different solution of the joint problem has been submitted in the form of the new Roach Joint, manufactured by the Reinforced Rail Joint Company, St. Louis, Mo.

The principal function of this joint is to keep the treads of adjoining rails co-incident at the point of juncture while leaving the rails free to bend independently under load. As seen in the accompanying photograph, this joint is essentially a pair of fish plates, although presenting a marked difference from the old-fashioned fish plates in that the fishing surfaces are on convex curves, that is, the splice bar is deeper at the midpoint than at the ends. Because of this, the fishing surfaces of the plate come to bearing on the fishing surfaces of the rails, only at the middle where the two rails join, and with the inside face of the fish plate at some distance from the web of the rail as in the ordinary angle bar. At the ends of the bar, however, the fishing surfaces are not in contact, so the bolting up of the joint has the effect of bending the splice bars until their inside surfaces come in contact with the web of the rail. Under this construction and with sufficient allowance in the bolt holes for expansion and for the bending of the rails under traffic, the joint bars may serve to hold the rails in coincidence at the joint without being themselves subjected to bending stresses by the load.

Some of the claims made for this joint are that it eliminates rail breakages in the joints and breakage of the



The Roach Joint in Track

joint itself; that stresses in the bolts are reduced, that the joint has only half as much metal as the lightest form of any other type of joint; that it is the simplest joint and therefore the easiest to apply; that it can be applied at the heels of switches and frogs with the same ease as on other joints and without change of design; that the spacing of ties is unnecessary, that the bases of rails can be spiked opposite the Roach bars the same as at any other part of the rails, and that standard tie plates can be used throughout. The bars may also be removed and replaced without having to draw the spikes. Joints of this type have been in use on several southwestern railroads for several months.

The Clarification of Boiler Waters

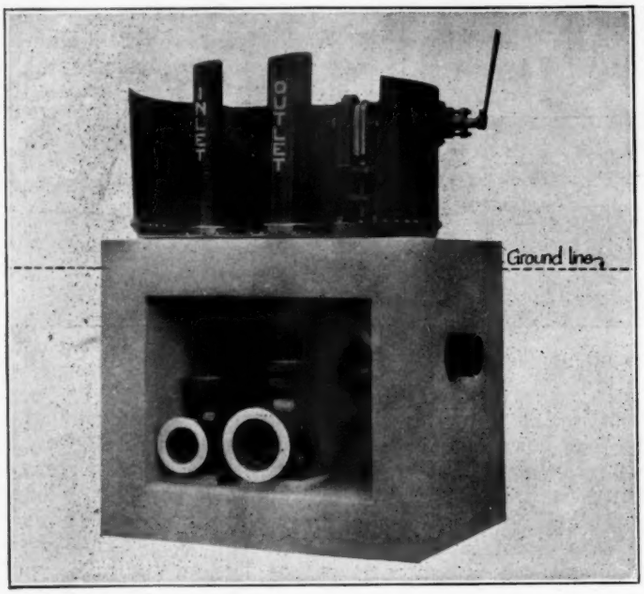
ONE OF THE ADVANTAGES of the large riser pipe type of water tank arises from the opportunity it affords for sedimentation and disposal of matter held in suspension in the water. The water may be naturally muddy as when coming from a stream like the Missouri river, or it may contain precipitated solids through the use of soda ash or some other reagent to accomplish a partial water treatment where for any reason it has not been thought desirable to install a complete water softening plant.

The manner in which the base of the large riser pipe acts as a settling basin or sludge sump is shown in the sectional illustration. The outlet and inlet pipe extend up into the riser pipe for a distance of 10-ft. or more so that there is a considerable portion of the riser pipe below the tops of the inlet and outlet pipes which can serve for the accumulation of the suspended matter. A specially arranged wash-out valve is provided at the bottom which is easily operated from the outside by a lever while the tank is in service.

In accordance with this idea, a large number of the tanks furnished by the Chicago Bridge & Iron Company for the Chicago, Burlington and Quincy have been equipped and are operated as treating tanks. The soda-ash is sprayed over the top of the inlet pipe as the water is pumped into the tank, the sediment being precipitated

to the bottom of the large riser pipe. All of the tanks which have been furnished to this railroad in the past few years have been equipped for water treatment so that the process may be installed at any time without the delay or expense incident to putting the tank out of service. The Wabash has also applied this method of water treatment to a number of tanks furnished by the same company.

As many water stations are located where water is pumped from mud-bearing streams, the large riser pipe is more generally used for the collection and discharge



Sectional View of the Riser Pipe Base, Showing Arrangement

of mud than for soda-ash treatment. The matter held in suspension soon settles in the bottom of the large riser where is may be discharged through the washout valve. The Illinois Central tanks at Dyersburg and Obion, Tenn., are both supplied from muddy streams so that it is necessary during certain seasons of the year to sludge the sediment out through the washout valve every few days. The problem of securing cleaner and purer water for locomotive service is of particular importance at this time and the method of securing these results by means of this type of tank is of interest, as the results are obtained with practically no labor expense.

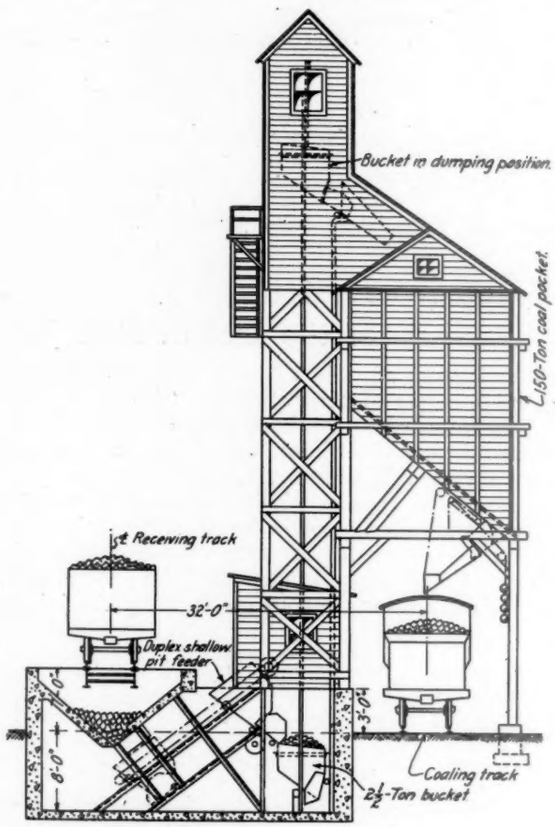
A New and Economical Coal Handling System

THE BUCKET PITS 24 to 25 ft. deep required with the counterbalanced or balanced bucket-type coal handling plants are occasionally a source of trouble and expense where wet excavation, rock or quicksand are encountered. Because of this, the Roberts & Schaefer Company, Chicago, perfected a duplex shallow pit loader which eliminates the deep pit while still retaining the advantages of the large bucket, and during the past two years installations involving this type of pit have been made at Paintsville, Ky.; East Ely, Nev.; Las Vegas, N. M.; South Chicago; South Brownsville, Pa., and Chicago.

In this new design the coal is received in a 20-ft. long track hopper in the regular manner. Directly in front of the aperture of the hopper is an undercut gate made of ½-in. steel plate operating on rollers. This gate, in its opening and closing feature, is actuated by the ascent and descent of the duplex feeder, which has a capacity of 2½ tons. This feeder is a large structural steel box, which rolls on flanged rollers on a heavy angle-iron track carried on the structural steel supporting frame in the bucket pit. The loader is direct connected by gears to the hoist which elevates the bucket; the gears being so timed that the loader makes its trip upward as the bucket descends, the ratio being about five to one.

On the front of the measuring receptacle is an apron equipped with a roller which likewise travels on a guide, which prevents its opening except when discharging the load into the bucket. The apron folds over a pair of pulleys in discharging coal into the elevating bucket. With this design noise is eliminated and the operation of machinery in pit is silent.

The duplex shallow pit loader permits the installation



A Cross Section of the Plant

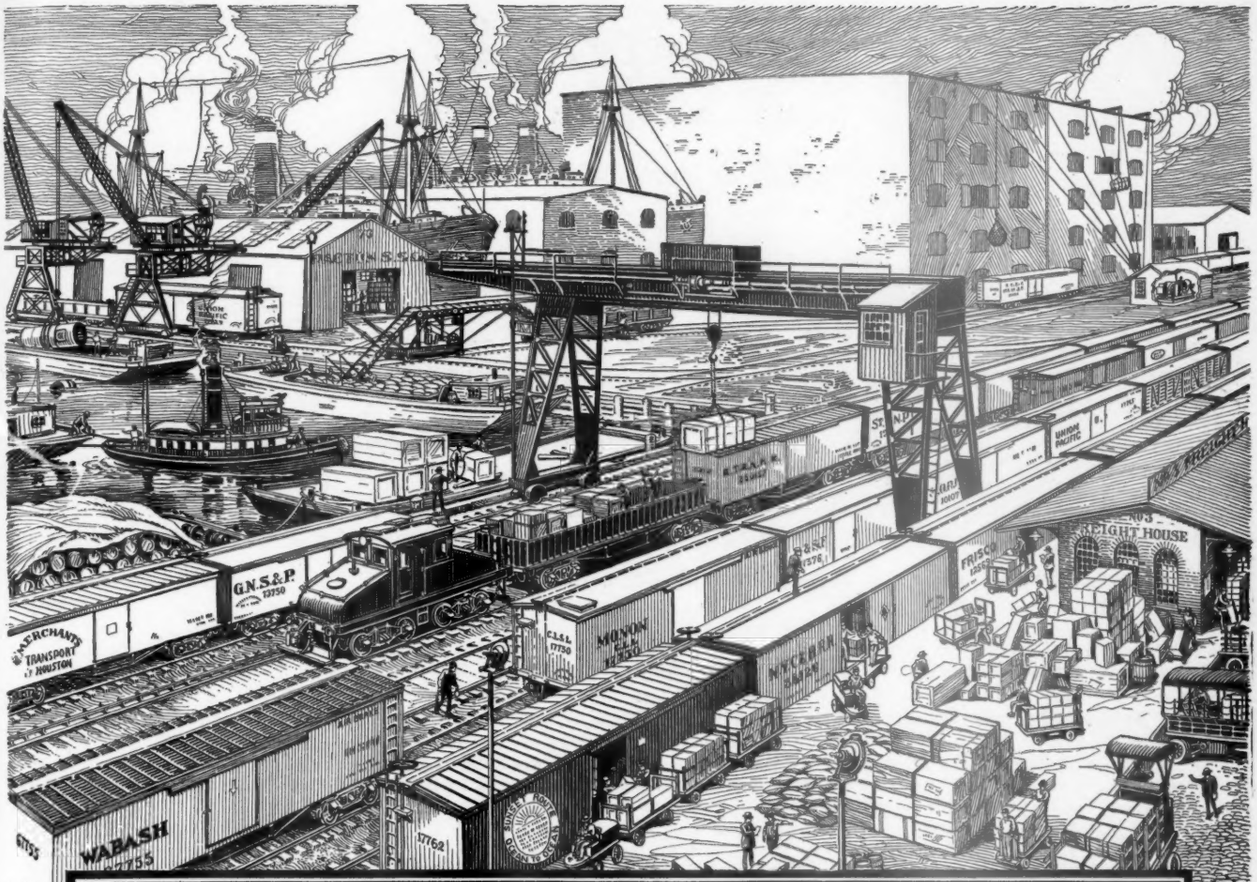
of a 12-ft. pit by elevating the receiving track 2 ft. above the coaling track. It also permits coaling on a track which is located 32 ft. from the receiving track, as shown in the plan.

"Never Again"

He found his own front porch with wonderful accuracy, navigated the steps with precision, and discovered the keyhole by instinct. Once in the dimly lighted hall, there was an ominous silence followed by a tremendous crash.

"Why, what has happened, George?" came a voice from above.

"It's all right, Mary, but I'll—I'll learn those goldfish to snap at me!"



Electricity Relieves Freight Congestion

Freight congestion is being relieved by the use of electric power for the operation of freight handling machinery. Important Eastern marine terminals are equipping with electrically operated winches and hoists, cranes, portable conveyors, storage battery trucks and locomotives. Electric flood lights make the work continuous as the nation's need is speed.

Trackless trains of storage battery trucks and trailers enable 100 men to increase loading from 16 to 40 cars daily.

Fleets of storage battery trucks have reduced ship loading time 35% and car loading time 38%.

At one terminal city portable conveyors are releasing the labor of fifteen men for other work and the freight is unloaded in one-third the time required for hand work.

Electric locomotives are being used for shifting or drilling cars at a number of terminals with excellent results.

The General Electric Company has equipped freight handling machinery in many places with electric motors and control equipment and made night operation efficient by proper electric lighting equipment. Its experience in this specialized field may be of service to others. Your inquiries will be given the best attention of experienced engineers.

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